May 2025

Environmental Impact Assessment Report - Volume 2

Application for Continuation of the Murrens Quarry

JJ Flood & Sons Manufacturing Limited

Murrens Quarry Oldcastle, Co. Meath

MALONE O'REGAN ENVIRONMENTAL

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Environmental Impact Assessment Report

Application for Continuation of the Murrens Quarry

JJ Flood & Sons Manufacturing Limited

Murrens Quarry, Oldcastle, Co. Meath

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1 GENERAL

This Environmental Impact Assessment ('EIAR') has been prepared by Malone O'Regan Environmental Services ('MOR Environmental') on behalf of our client JJ Flood & Sons Manufacturing Ltd ('the Applicant'), for future development at the Murrens Quarry, Oldcastle, Co. Meath ('the Site').

1.1 Introduction

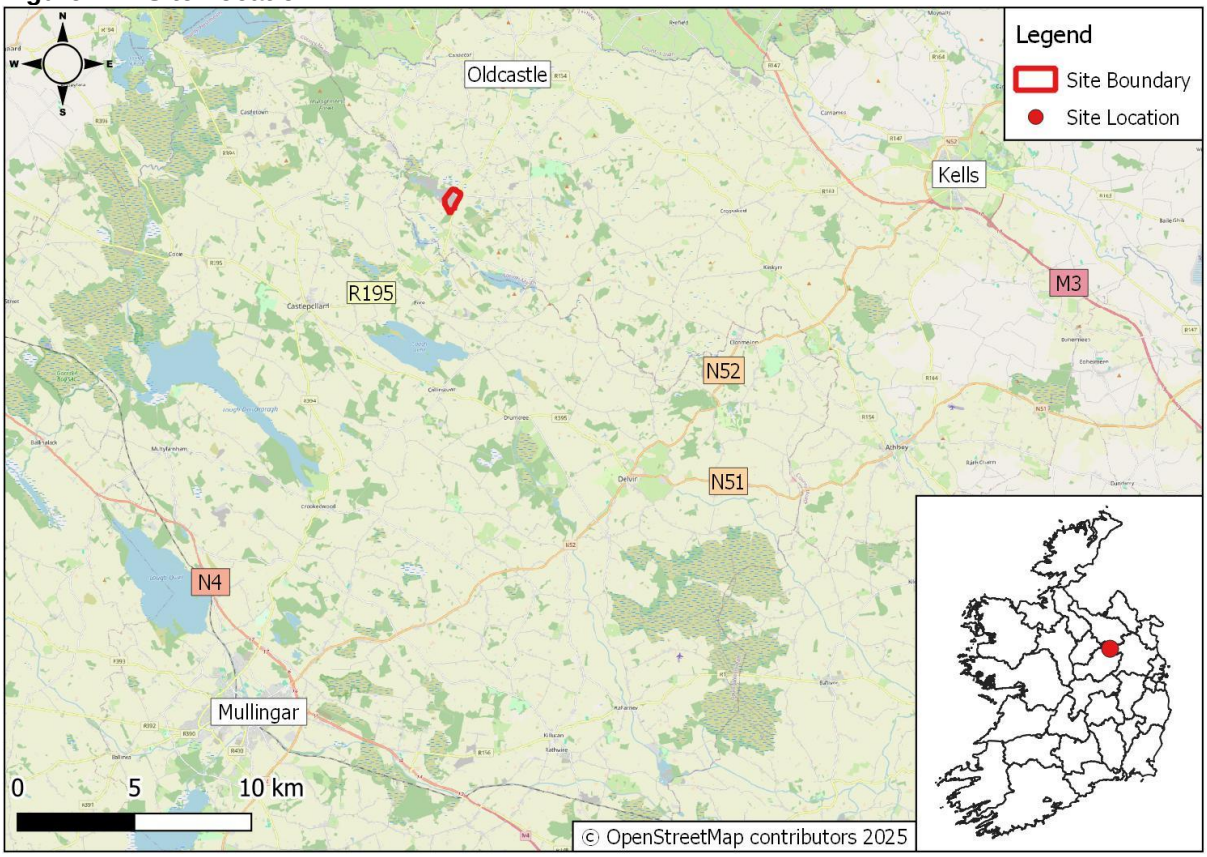
The Applicant operates a gravel pit and soft rock quarry, known as Murrens Quarry, south of Oldcastle in County Meath. The quarry is recognised as having pre-1963 origins.

Substitute Consent is being sought under Section 177E of the Planning and Development Act, 2000, as amended, to regularise a circa ('ca.') 39 hectares ('ha') area of land within the Applicant's landholding which has been subjected to gravel and soft rock extraction and processing. The application for substitute consent was submitted to An Bord Pleanála ('ABP') on 31st March 2025, case number ABP-322189-25. Further details are in chapter 2.2 below.

Following the submission of the substitute consent application, this EIAR has been prepared to support a planning application for future development and restoration of the same quarry, including extension into a 1.02 hectare greenfield. Future development of the quarry will involve continuation of quarrying activities within the 40.12ha Site, with deepening in two areas of the Site, ca. 6.35ha, to the existing pit floor of 119mOD, site preparation works, and restoration works over the full Site (the Proposed Development). A project life of 20 years is being sought to complete all works.

The Site lies in the townland of Murrens, Oldcastle, Co Meath (ITM 652523 774771) and is presented in Figure 1-1 below.

Figure 1-1: Site Location



This EIAR is structured as follows:

- Volume 1 – Non-Technical Summary;
- Volume 2 – Main Report (this document); and,
- Volume 3 – Appendices with supporting technical reports, drawings and historical documents.

1.2 The Applicant

David Flood is the director of J.J. Flood & Sons Manufacturing Limited, a company based in Oldcastle, County Meath. Under his leadership, the company has continued to thrive in the manufacturing sector.

J.J. Flood & Sons Manufacturing Limited was established on 4th October 1994. The company operates out of Carnaross, Kells, Co. Meath, and has maintained a strong presence in the industry for over three decades. The company is known for its commitment to quality and innovation in manufacturing, which has helped it build a solid reputation in the market.

J.J. Flood & Sons Manufacturing Limited continues to be a key player in the manufacturing sector locally and regionally.

They specialise in the manufacture of concrete products for construction purposes, which broadly includes:

- Concrete Blocks: Used in various construction projects for building walls and foundations;
- Paving Products: Includes concrete paving stones and slabs for outdoor spaces; and,
- Aggregates: Sand, gravel, and other aggregates used in construction and landscaping.

Activities at the Site involve the mechanical extraction of stone, its processing, grading, washing, and short-term storage.

1.3 Site Context

The Site lies in the townland of Murrens, Oldcastle, Co Meath (ITM 652523 774771) and covers an area of ca. 40.12ha. The Site is bounded to the west by a quarry operated by BD Flood Ltd. and to the east by the R195 road. The Site is bounded to the north and south by agricultural and forested land.

The Site is situated ca. 5.5km south of the town centre of Oldcastle and ca. 7.3km northeast of the town centre of Castlepollard, which are connected by the regional road R195 which passes along the eastern boundary of the Site.

The R195 runs in a north-to-south direction and connects to the R194 west of Virginia town, ca. 14.5km to the north of the Site. The R195 immediately to the east of the Site provides the primary transport route for Heavy Goods Vehicles ('HGVs') accessing and egressing the Site.

The lands around the Site are primarily agricultural with scattered single-dwelling developments along the regional road and the access road into the Site. The western boundary of the Site is shared with an adjoining quarry development, with an embankment of untouched ground separating the two developments. To the south is a forested area.

The Site covers the majority of the land holding. The Site is primarily comprised of exposed gravel deposits and exposed bedrock, with the main processing area located centrally. The water usage within the Site consists of a series of settlement ponds located in the north of the Site and a settlement canal located adjacent to the main processing area. No water is discharged off-site. Refer to Figure 1-2 below.

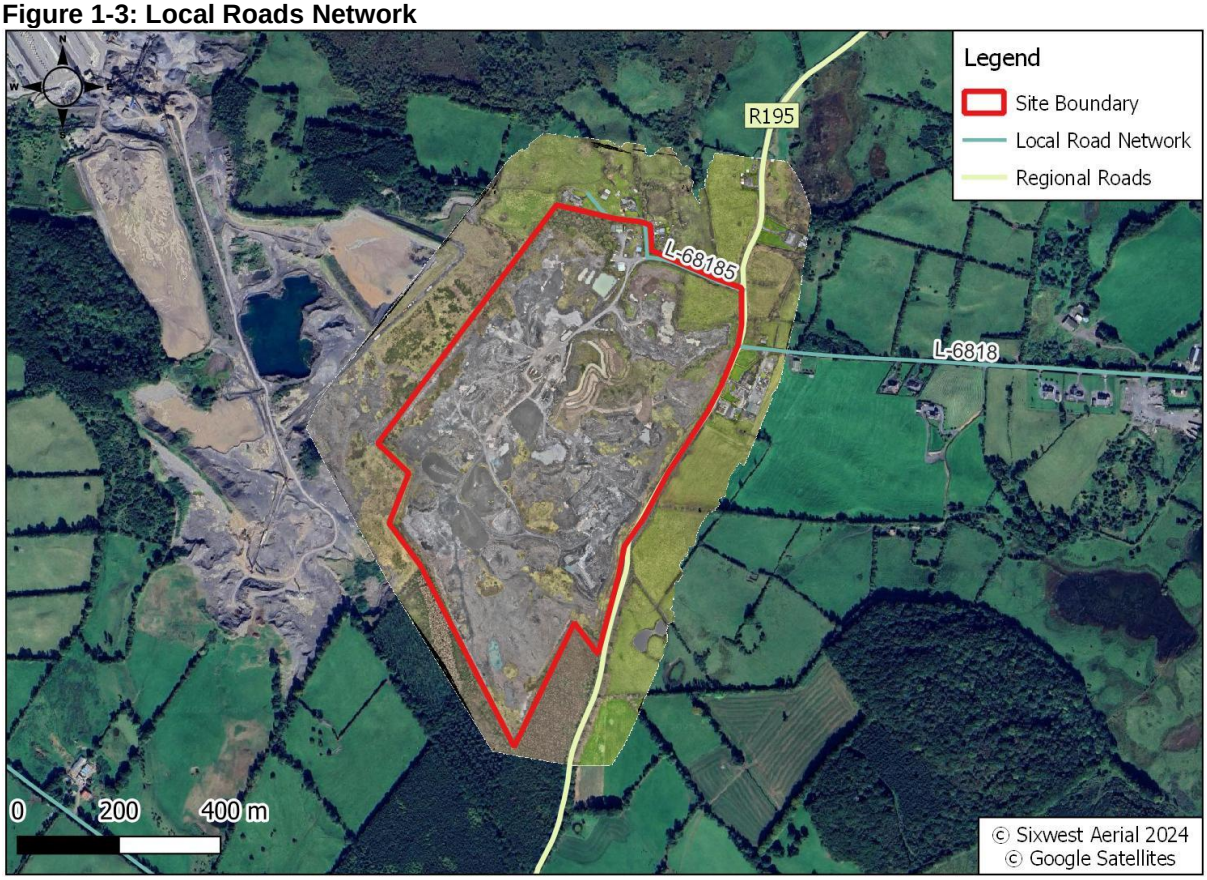
The planning history of the Site is presented in Chapter 2.

Figure 1-2: Site Context

Access to the Site is via the existing L68185 local road. The existing L68185 is a cul-de-sac that is approximately 200m in length and provides access to the existing quarry, a farmyard and a number of residential dwellings. The L68185 provides access to the R195 regional road, to the northeast of the Site.

The R195 regional road carries local traffic between Oldcastle and Castlepollard. A speed limit of 80km/h applies along the existing R195 regional road, while no speed limit signs are provided along the L68185. The Proposed Development will only utilise the existing quarry entrance. Refer to Figure 1-3 below for context.

Figure 1-3: Local Roads Network



1.4 Project Background

The Site, ca. 40.12ha, has been used to extract and process gravel and soft rock by mechanical means, with origins prior to 1963. The Site entrance is located in the northernmost corner, onto regional road R195. The Murrens Quarry includes the following:

- Extraction area (previously stripped ca. 39ha);
- Dry mobile screening plant;
- Aggregate washing plant;
- Semi-mobile crushing plant;
- Settlement canal system;
- Associated settlement ponds;
- Stockpiles of aggregate;
- Site access road;
- On-site haulage routes;
- Site office and toilets (ca. 77m^2);
- Wastewater treatment and percolation;
- Storage shed (ca. 375m^2);
- Maintenance Shed (ca. 164m^2);
- Two fuel tanks (ca. 153m^3);

- Vehicle parking;
- Weighbridge; and,
- Aggregate additives for making 'arena footing'.

The aggregate extracted on-site is high-quality sand, gravels and soft rock products for the construction industry. These materials are some of the main sources of construction aggregate, and therefore, this material is in high demand.

The Quarry currently employs ca. nine members of staff directly as onsite personnel, hauliers, maintenance crews and off-site staff. Additional employment is generated from the Site through the direct contracting for machinery maintenance and upkeep, as well as ancillary requirements for professional services, including, though not limited to:

- Health and safety specialists;
- Environmental monitoring personnel; and,
- Quality control personnel.

1.5 Overview of the Proposed Development

Planning is being sought for the continuation of quarrying activities within the Site for 20 years and the ca. 1.02-hectare extension of extraction activities into a greenfield site to the northeast of the existing quarry. Two years are being sought to complete the restoration post-extraction for a total project life of 20 years.

The Proposed Development will not impact employment as the current employees will be retained and no additional jobs will be created. It is also not proposed that new facilities such as a canteen, office or washroom be introduced as these facilities are already in place within the Site.

The need for the Proposed Development is discussed in further detail in Section 2.5 of Chapter 2 of this EIAR. Details of the future development works are presented in Chapter 3 of this EIAR and will include the following:

- Removal of existing stockpiles located across the Site ca. 132,470m^3 volume;
- Restoration works within the boundary of the existing quarry where future operations will not be taking place utilising onsite soils and imported non-waste soils;
- Site preparation works for quarry excavation activities;
- Future extraction of soft rock aggregate, as well as rock aggregate, in designated areas of the existing quarry, ca. 6.35Ha including ca. 1.02Ha of greenfield land located to the northeast of the existing quarry, ca.461,500m^3 volume; and,
- Restoration of the future operational area of the Site.

Operations on-site will remove the remaining stockpiles of processed aggregates located around the site, clearing various sections for restoration work to commence. An estimated 132,470 m^3 of aggregate is stored and available on the Site.

In tandem, plant and machinery will commence to remove the aggregate remaining within two areas of the Site, covering approximately 6.35 hectares in total, and approximately 461,500m^3 of aggregate. This material is located along the eastern boundary, with most of the land, ca. 5.33 Ha, already having undergone historic stripping and partial extraction.

The removed aggregate will undergo processing through mobile screeners and crushers, and the onsite washing plant will also be utilised to get higher-quality cleaned stone. During the extraction, occasionally larger rocks will arise. These will be collected and stored before

operating an excavator with a pneumatic rock breaker attachment to break these rocks into smaller pieces for putting through the crusher. The rock breaking will occur within the existing quarry floor area, to maximise distance from the site boundary. Refer to Chapter 11, Noise and Vibration.

Immediate restoration works will be carried out across the Site where future operations will not be required. These restoration works will be carried out in tandem with the site preparation and future extraction works. Restoration of the rest of the Site will be carried out when future operations and extraction works have ceased. It is planned that the restoration works will require the importation of non-waste inert soils to provide substrate for plants to take root.

Nationally, the movement of inert soil from a site where it is in surplus, to a site where it is needed, is notified to the EPA as a 'by-product' material in accordance with the document titled, "*Guidance on Soil and Stone By-products in the Context of Article 27 of the European Communities (Waste Directive) Regulations 2011"* [1].

Notifications to the EPA to date have been assessed on a case-by-case basis [2]. If the restoration works are carried out using inert soil classified as a by-product, the Development will be operated in accordance with the document titled "*Consultation Paper Regulation 27(7) National By-Product Criteria for Greenfield Soil and Stone used in Developments*" [3]. The Local Authority would regulate the Site under planning conditions.

1.6 Notable Developments in the Area

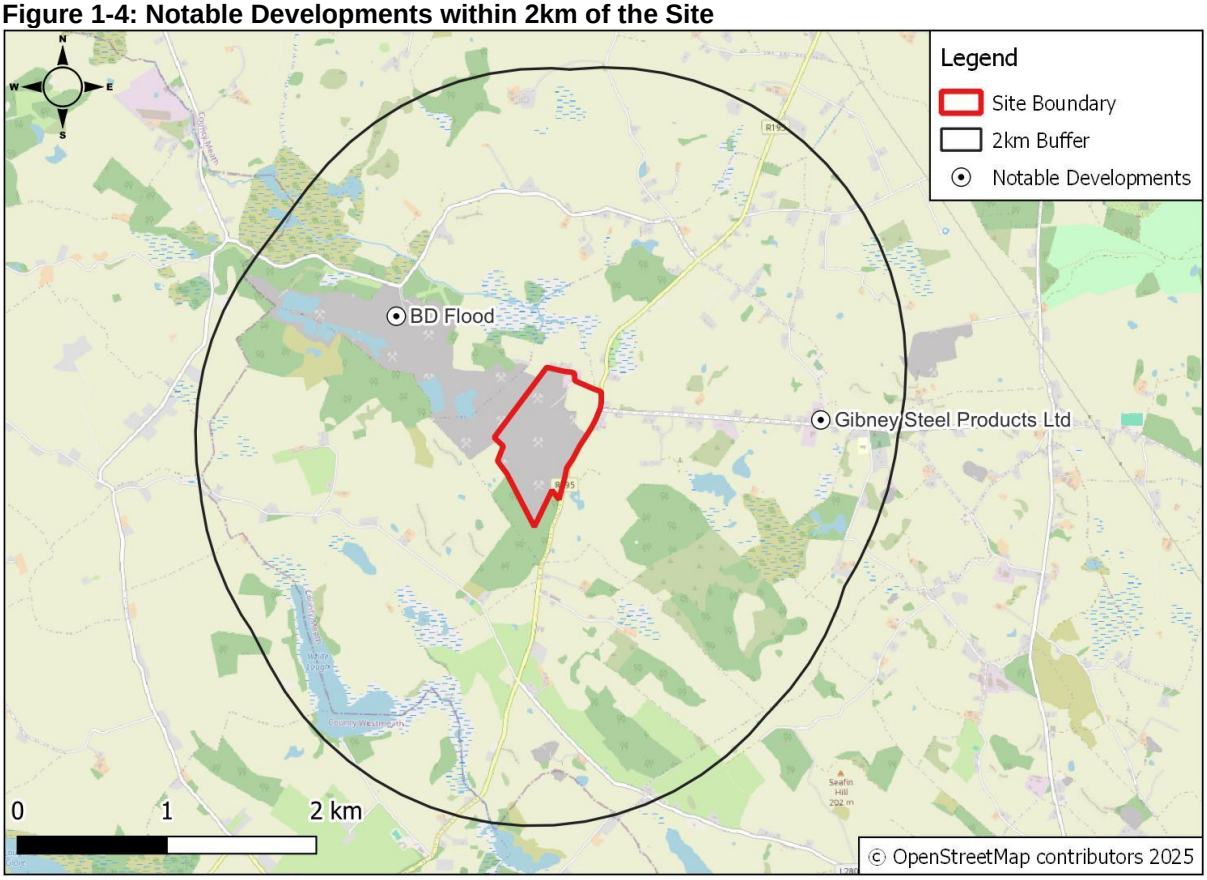
Notable developments are defined as existing or proposed developments in the area that have the potential to interact with the Proposed Development and lead to potential in-combination effects.

A review of developments within 2km of the Site has been undertaken utilising the following sources:

- Meath County Council ('MCC') planning portal [4];
- Environmental Impact Assessment ('EIA') portal [5];
- An Bord Pleanála ('ABP') Portal [6];
- Aerial imagery from Google Earth [7]; and,
- Meath CDP 2021-2027 [8].

Most proposed and existing developments within the 2km study area of the Site were residential dwellings, farm buildings or small-scale projects. Another quarry and processing plant is located at the western boundary of the quarry, run by BD Flood Ltd., which is 'substantially comprised of lands which were once part of the Flood family lands from which both quarries originated'. Gibney Steel Products Ltd. is located ca. 1.5km east of the Proposed Development. These are the most significant developments within the 2km study area. Figure 1-4 below presents notable developments as points of interest ('POI') within the study area.

Figure 1-4: Notable Developments within 2km of the Site



Given the small-scale nature of the developments in the study area, it is not considered that the Proposed Development will lead to in-combination effects within the study area. Any effects arising from the activities of the adjoining BD Flood development have been considered within the respective specialist chapters.

1.7 The Environmental Impact Assessment Report ('EIAR')

This EIAR has been prepared in accordance with the requirements of the following legislation:

- The Planning and Development Act, 2000, as amended [9];
- Part II of the first Schedule of the European Communities (Environmental Impact Assessment ('EIA')) (Amendment) Regulations, 1999 (S.I. No. 93 of 1999) [10];
- The Local Government Planning and Development Regulations 2001, as amended (S.I. No. 600 of 2001 and subsequent amending legislation) [11]; and,
- European Union ('EU') (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (S.I. No.296 of 2018) [12].

The following existing and draft guidance were considered in preparing this EIAR:

- European Commission: *Interpretation of definitions of project categories of Annex I and II of the EIA Directive*, 2015 [13];
- European Commission: *Guidance on the preparation of the Environmental Impact Assessment Report*, 2017 [14];
- Environmental Protection Agency ('EPA'): *Guidelines on the Information to be contained in Environmental Impact Assessment Reports*, 2022 [15];

- Department of Housing, Planning and Local Government ('DeHPLG'): *Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment*, 2018 [16];
- Department of Environment Heritage and Local Government ('DeEHLG'): *Quarries and Ancillary Activities: Guidelines for Planning Authorities*, 2004 [17];
- EPA (2006): Environmental Management in the Extractive Industry (Non-Scheduled Minerals) [18];
- Department of Arts, Heritage and the Gaeltacht ('DeAHG'): *Wildlife, Habitats & the Extractive Industry*. Dublin, 2007 [19];
- Department of Housing, Planning, Community and Local Government ('DeHPCLG'): *Implementation of Directive 2014/52/EU on the effects of certain public and private projects on the environment (EIA Directive) Circular Letter 1/2017*, May 2017 [20];
- DeHPCLG: *Transposition of 2014 EIA Directive (2014/52/EU) in the Land-Use Planning and EPA Licencing Systems Key Issues Consultation Paper*, May 2017 [21]; and,
- Office of the Planning Regulator ('OPR'): *OPR Practice Note PNO2 - Environmental Impact Assessment Screening*, 2021 [22].

1.7.1 EIA Amending Directive (2014/52/EU)

On 14th April 2014, the EIA Directive (2014/52/EU) (the EIA Amendment Directive) was adopted by the Council of the EU, which amended Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment. Article 2 of the EIA Amendment Directive required all member states to bring the Directive into force by 16th May 2017.

The EIA Amendment Directive clarified aspects of the preceding Directive 2011/92/EU to bring it into line with intervening European Court of Justice ('ECJ') judgments and introduced additional provisions and procedural options. Therefore, compliance with the EIA Amendment Directive (2014/52/EU) will automatically ensure compliance with Directive 2011/92/EU. In Ireland, the EU (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (S.I. 296 of 2018) came into effect on 1st September 2018 and gave effect to Directive 2011/92/EU as amended by the EIA Amendment Directive.

Article 1 (2)(g) of the Amending EIA Directive provides that an EIA means a process consisting of;

1. The preparation of an environmental impact assessment report by the developer;
2. The carrying out of a consultation;
3. The examination by the competent authority of the information presented in the environmental impact assessment report and any supplementary information provided, where necessary, by the developer and any relevant information received through consultation;
4. The reasoned conclusion by the competent authority on the significant effects of the project on the environment, taking into account the results of the examination referred to in point (c) and, where appropriate, its own supplementary examination; and,
5. The integration of the competent authority's reasoned conclusion into its decision.

An EIAR document is produced as a key component of the environmental impact assessment ('EIA') process. It describes:

- The baseline environment;
- The identification of the potential effects (if any – both positive and negative) that are predicted to be incurred as a result of the Proposed Development;
- Control and mitigation measures required to avoid, reduce or eliminate such potential effects; and,
- Reasonable alternatives, studied by the persons who prepared the EIAR, relevant to the Proposed Development and its specific characteristics.

1.7.2 Assessment under Schedule 5 (Mandatory EIAR)

The relevant classes of developments (with regard to the Proposed Development) that require EIA are set out in Schedule 5 of the Planning and Development Regulations 2001 (as amended). Schedule 5 transposes Annex I and Annex II of the EU EIA Directive (85/337/ECC as amended) into Irish law under Parts 1 and 2 of the Schedule. There are no new criteria under S.I. No. 296 of 2018.

The Proposed Development is for the continuation of quarrying activities within the quarry and the extension of extraction activities into a greenfield site to the northeast of the existing Quarry.

Part 1- Item 19:

> *"Quarries and open-cast mining where the surface of the site exceeds 25 ha."*

The application area is ca. 40.12ha which includes stockpile removal, restoration and future extraction works, along with processing and storage areas. Immediate restoration during the opening years of this project proposed as part of this planning application will reduce this quarry area, if permitted.

The Proposed Development, considered by itself, would constitute an activity that requires a mandatory EIAR under Part 1.

With respect to Part 2 of Schedule 5 of the Planning and Development Regulations 2001 (as amended), the following activities have been identified as potentially relevant to the Proposed Development:

Part 2. Item 2(b) – Extractive Industry:

> *"Extraction of stone, gravel, sand or clay, where the area of extraction would be greater than 5 hectares."*

Part 2 – Item 13(a) - Changes, extensions, development and testing*:*

> *"Any change or extension of development already authorised, executed or in the process of being executed (not being a change or extension referred to in Part 1) which would:-*
>
> *i) result in the development being of a class listed in Part 1 or paragraphs 1 to 12 of Part 2 of this Schedule; and,*
> *ii) result in an increase in size greater than:*
>
> - *25 per cent; or,*
> - *an amount equal to 50 per cent of the appropriate threshold, whichever is the greater.*

The Proposed Development is a continuation and extension of a development which is currently undergoing authorisation under substitute consent sought under Section 177E of the Planning and Development Act, 2000, as amended.

The operational area and future extraction area of the Proposed Development will cover an area of ca. 40.12ha. Within this, the future extraction areas, as shown in Figure 3-4 of Chapter 3 of this EIAR, cover a combined area of ca. 6.35ha. This includes approximately 5.33ha of the existing Site as well as ca. 1.02ha of the greenfield site, into which extraction activities are proposed to extend.

As such, the Proposed Development is deemed to be subject to EIA under Part 2, Item 13(a).

1.7.3 Scope of the EIAR

In accordance with EPA Guidelines [15], the following attributes of the receiving environment and their interactions will be addressed within this EIAR:

- Population and Human Health;
- Biodiversity;
- Land, Soils and Geology;
- Water (Hydrogeology and Hydrology);
- Air Quality;
- Climate;
- Acoustics (Noise and Vibration);
- Landscape and Visual Impact;
- Cultural Heritage; and,
- Material Assets – Traffic and Transport.

1.7.4 Structure of the EIAR

Table 1-1 describes the EIAR structure.

Table 1-1: Structure and Description of the EIAR

Title	Description
Volume 1: Non-Technical Summary ('NTS')	
NTS	The NTS contains an overview of the Proposed Development and the principal findings of the Environmental Impact Assessment ('EIA') in non-technical language.
Volume 2: Main EIAR Report	
Chapter 1- 4	Chapters 1-4 introduce the Proposed Development, describe the Proposed Development, the need for the Proposed Development and the alternatives considered.
Chapters 5-14	Chapters 5-15 comprise the assessment of predicted environmental effects, together with an evaluation of their significance and a description of any mitigation measures proposed to minimise effects. It also takes into account the interactions between the various environmental topics. Chapters 5-15 generally follows the structure set out below: a) A brief introduction to the chapter; b) An outline of the methodology employed; c) A description of the receiving existing environment relevant to the environmental topic under consideration; d) A description of the characteristics and predicted effects of the Proposed Development on the receiving environment;

Title	Description
	e) A description of the reductive or mitigation measures and / or the factors that will reduce or eliminate any significant environmental effects identified; f) A description of the residual effects of the Proposed Development. Residual effects are the remaining effects that will occur after the proposed mitigation measures have been taken into consideration; g) A description of the interactions with other environmental attributes; h) Details of any monitoring required during Site preparation and operations; i) Details of any rehabilitation required; and, j) Difficulties encountered in undertaking the assessment.
Chapter 15	Interactions of the Foregoing – provides an overview of the major interactions between the environmental impact topics assessed within Chapters 5-14.
Chapter 16	Chapter 16 outlines the overall Schedule of Commitments agreed by the applicant in the event that the planning application is authorised.
Volume 3: Appendices	
Appendix	Relevant topic-specific technical documentation supporting the EIAR are contained within appendices which are presented as a separate Volume of the EIAR (Volume 3).

1.8 Methodology

1.8.1 Assessment of Effects – Evaluation Criteria

The assessment of effects has been undertaken in accordance with best practice, legislation and guidance notes, as listed in Section 1.7 above. The evaluation of significance considers the magnitude of the change and the sensitivity of the resource or receptor. Unless otherwise stated, this approach has been adopted throughout the EIAR.

The criteria for determining the significance of impacts and the effects are set out in Figure 1-5 below, taken from the EPA Guidance, Guidelines on the Information to be contained in an EIAR [15]. Definitions of effect, as outlined by the EPA, are included in Tables 1-2 to 1-7 below. These definitions are used throughout the EIAR. Certain chapters may use additional or alternative terms due to the specific methodology or guidance required within those chapters. Such alternative uses will be stated within the chapter.

Figure 1-5: Description of the Environmental Effects

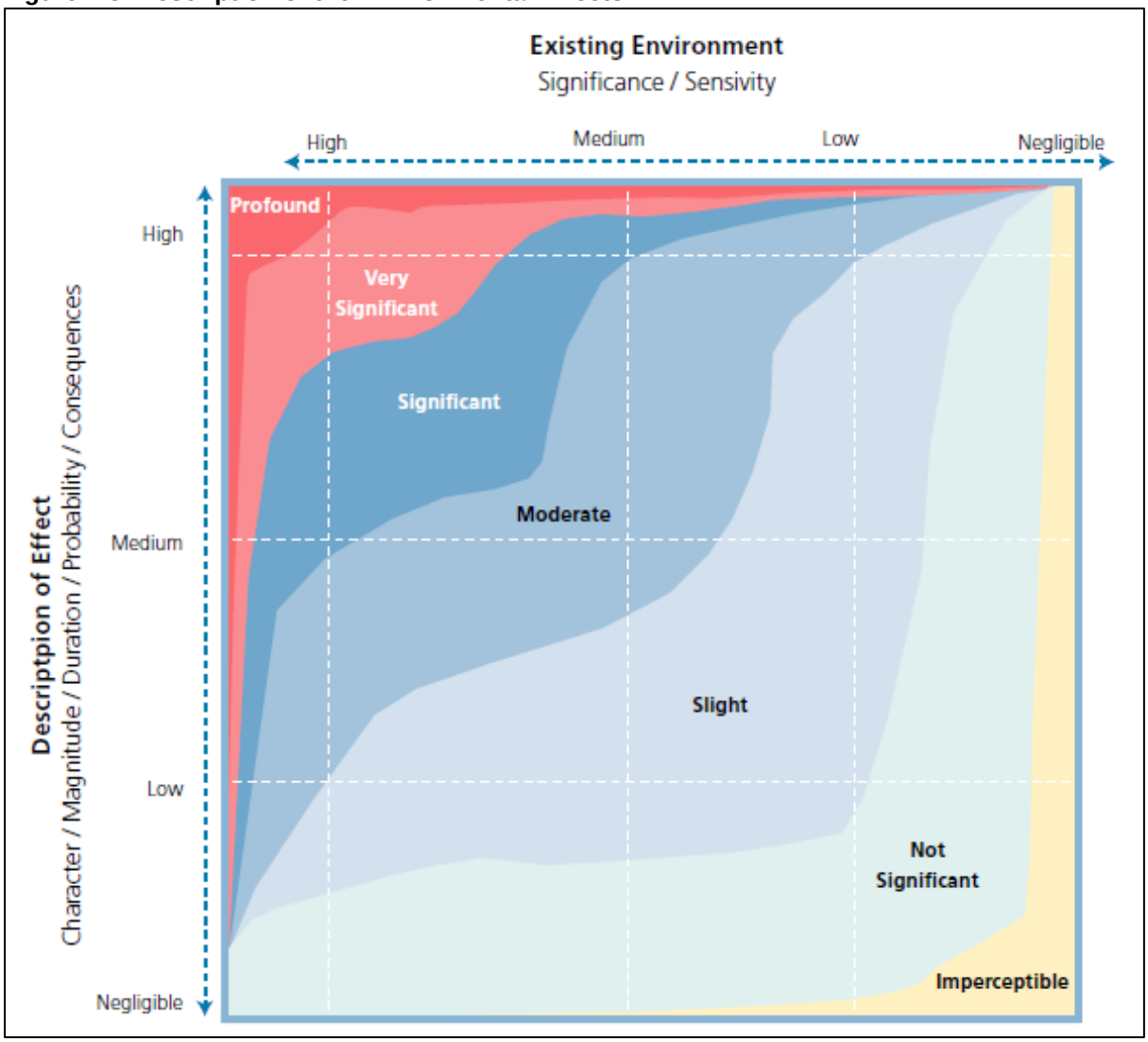


Table 1-2 defines the quality of the Proposed Development's effect on the environment, which ranges from positive to negative.

Table 1-2: Quality of Effect

Type of Effect	Quality of Effect
Positive Effects	A change which improves the quality of the environment.
Neutral Effects	No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
Negative / Adverse Effects	A change which reduces the quality of the environment.

Table 1-3 outlines the definitions of significance of effect of a Proposed Development on the environment ranging from imperceptible to profound.

Table 1-3: Definitions of Significance of Effect

Classification	Criteria
Imperceptible	An effect capable of measurement but without significant consequences.
Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
Slight Effects	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate Effects	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
Significant Effects	An effect which, by its character, magnitude, duration or intensity, alters a sensitive aspect of the environment.
Very Significant	An effect which, by its character, magnitude, duration or intensity, significantly alters most of a sensitive aspect of the environment.
Profound Effects	An effect which obliterates sensitive characteristics.

Table 1-4 describes the terminology used to discuss the extent and context of effect of a Proposed Development on the environment.

Table 1-4: Describing the Extent and Context of Effects

Magnitude	Description
Extent	Describe the size of the area, the number of sites, and the proportion of a population affected by an effect.
Context	Describe whether the extent, duration, or frequency will conform or contrast with established (baseline) conditions (is it the biggest, longest effect ever?)

Table 1-5 shows how likely an impact is to occur.

Table 1-5: Describing Probability of Effect

Magnitude	Description
Likely Effects	The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.
Unlikely Effects	The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.

Table 1-6 discusses the duration and frequency of effects. Momentary effects lasting from seconds to minutes will often be less concerning than long-term and permanent effects, depending on their severity.

Table 1-6: Describing Duration and Frequency of Effects

Magnitude	Description
Momentary Effects	Effects lasting from seconds to minutes.
Brief Effects	Effects lasting less than a day (<1 day).
Temporary Effects	Effects lasting less than a year (<1 year).

Magnitude	Description
Short-term Effects	Effects lasting one to seven years (1-7 years).
Medium-term Effects	Effects lasting seven to fifteen years (7-15 years).
Long-term Effects	Effects lasting fifteen to sixty years (15-60 years).
Permanent Effects	Effects lasting over sixty years (>60years).
Reversible Effects	Effects that can be undone, for example through remediation or restoration.
Frequency of Effects	Describe how often the effect will occur. (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually).

Table 1-7 defines the types of effects that can potentially occur as a result of a Proposed Development.

Table 1-7: Describing Types of Effects

Magnitude	Description
Indirect Effects (a.k.a. Secondary Effects)	Impacts on the environment, which are not a direct result of the project, often produced away from the project site or because of a complex pathway.
Cumulative Effects	The addition of many minor or significant effects, including effects of other projects, to create larger, more significant effects.
Do Nothing Effects	The environment as it would be in the future should the subject project not be carried out.
`Worst case' Effects	The effects arising from a project in the case where mitigation measures substantially fail.
Indeterminable Effects	When the full consequences of a change in the environment cannot be described.
Irreversible Effects	When the character, distinctiveness, diversity or reproductive capacity of an environment is permanently lost.
Residual Effects	The degree of environmental change that will occur after the proposed mitigation measures have taken effect.
Synergistic Effects	Where the resultant effect is of greater significance than the sum of its constituents (e.g. combination of SO_x and NO_x to produce smog).

1.8.2 Assessment of Cumulative Impacts

Cumulative effects have been considered within the EIAR under each relevant environmental topic in Chapters 5 to 15. This assessment considers Annex IV(5) subsection (e)23 of the EIA Directive, as amended, states that an EIAR should contain:

> *"A description of the likely significant effects of the project on the environment resulting from, inter alia:*
>
> *e) the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources."*

Annex IV(5) also states:

> *"The description of the likely significant effects on the [environmental] factors should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the project."*

1.8.3 Assessment of the Risk of Accidents and Unplanned Events

In accordance with the EPA guidance [15], the risk of accidents and unplanned events which may be either caused by or have an impact on the Site, have been assessed in all relevant specialist chapters of this EIAR. A risk-based approach was employed for these assessments, as recommended in the EPA guidance. [15]

1.9 Consultation and Scoping

A Substitute Consent application for the regularisation of historic works at the Site was submitted to ABP on 31st April 2025, case number: ABP-322189-25.

Due to the legal requirement to submit this EIAR within six weeks of the substitute consent application, insufficient time is available to undertake meaningful consultation prior to the submission of the application. However, the due process allocates for public participation following submission. As such, a consultation document was not issued.

1.10 Project Team

The MOR Environmental project team included the following:

Table 1-8: MOR Environmental Project Team

Name	Role	Relevant Qualifications	Chapter(s)
Kenneth Goodwin	Associate Director, Acoustics. Project Director.	BSc, PgD & DI Acoustics, Full Member IOA, IEMA Practitioner, 18+ years' experience	All chapters
Klara Kovacic	Associate Director, Air, Climate and Sustainability	MEng, MSc, MIEMA, CEnv, 17+ years' experience	Chapter 9 – Air and Chapter 10 Climate
Laura McGrath	Senior Consultant Hydrogeologist	P.Geo, MSc, BSc, 10 years' experience	Chapter 7 – Land, Soils & Geology Chapter 8 – Water
Dyfrig Hubble	Associate Director, Biodiversity	BSc, MScm CIEEM Full Member, 16+ years' experience in Ecological Impact Assessments	Chapter 6 Biodiversity
Niamh Tester	Author Environmental Consultant	BSc, 2 years' experience	All MOR Environmental chapters
Alexandra Allen	Environmental Consultant	MSc, 2 years' experience	Chapter 7 – Land. Soils & Geology Chapter 8 – Water
Margaret Gleeson	Environmental Consultant	BA Mod., MSc, IEMA member, 4 years' experience	Chapter 9 & 10– Air Quality & Climate Change

Name	Role	Relevant Qualifications	Chapter(s)
Patricia Redondo	Environmental Consultant	BEng, MSc Acoustics. Associate Member IOA	Chapter 11 – Noise and Vibration

In addition to the MOR Environmental project team, the following external specialists worked on the project:

Table 1-9 External Consultants

Primary Author	Company	Relevant Qualifications	Chapter
Thomas Beattie	SixWest	MSc, 13+ years' experience.	Engineering Drawings
Cian Doughan	Macro-works	Chartered Landscape Architect with +9 years of professional experience as a landscape designer and landscape and visual assessment specialist.	Chapter 12 – Landscape & Visual
Dr Charles Mount	N/A	MA and PhD in Archaeology, MBA, Dip EIA & SEA Management Member of Institute of Archeologists of Ireland.	Chapter 13 – Cultural Heritage
Richard Frisby	RoadPlan	BE & MEngSc, Chartered Engineer, 15+ years' experience with Roadplan.	Chapter 14 – Traffic & Transport

2 PLANNING AND POLICY CONTEXT

2.1 Introduction

This chapter sets out the context for the Site through an analysis of its history and most recent development plans, planning guidelines, policy frameworks, and reports issued by county, state, and semi-state bodies. It also includes the reasons or need for the Proposed Development, described in Chapter 3.

2.2 Planning Application History

The Site has a substantial history of quarry activities, with accepted pre-1963 origins.

2.2.1 Relevant Planning Applications History

Previous relevant planning application cases for the Site are listed in Table 2-1 below.

Table 2-1: Relevant Planning Application History

Planning Reference	Applicant	Development	Decision	Grant Year
971223	J.J. Flood	New entrance	Granted (Conditional)	1997
98967	J.J. Flood & Sons Ltd.	To construct an MV E.S.B. sub-station in the existing quarry	Granted (Conditional)	1999
ABP 322189-25	JJ Flood & Sons Manufacturing Limited	Substitute Consent application for historic activities supported by EIAR.	Live application 2025	-

2.2.2 Section 261 Registration

Section 261 of the Planning and Development Act, 2000, introduced a new system of once-off registration for all quarries. At the time of its introduction, many of the quarries in operation had a history of operation that predated the introduction of the Local Government (Planning and Development) Act, 1963, which came into force on 1st October 1964.

The purpose of Section 261 was to give local authorities an idea of the scale of quarrying activity in their area as well as basic information about a quarry's operation. It also allowed, where necessary, for local authorities to impose new or modified controls on quarry operations.

Murrens Quarry was registered under Section 261 in 2005 and was given the reference QY35, with MCC issuing 23 conditions for its operation in 2007. These conditions were imposed under S261(6)(a)(i), which is restricted to pre-1963 developments that, when greater than 5ha, are unlikely to cause a significant environmental impact.

2.3 Section 261A

In 2012, in accordance with its obligation under Section 261A of the amended legislation, MCC conducted a review of registered quarry QY35 and directed the quarry to apply for Substitute Consent following a decision in respect of this development made under section 261A(3)(a) of the Planning and Development Act 2000, as amended. This determination was appealed to ABP, who in 2013, upheld the Council's decision (ABP Ref. QV17.0015).

In respect of the need for Appropriate Assessment ('AA'), ABP specifically noted in their Determination:

(b) the location of the quarry in close proximity to two European sites (White Lough, Ben Loughs and Lough Doo Special Area of Conservation and Lough Bane and Lough Glass Special Area of Conservation,

(c) the potential cumulative impact on these European sites of quarrying operations at this site and an adjoining location (planning authority register reference number QY24); and,

(d) the uncertainty regarding the hydrological linkages between this quarry and the European sites.

The ABP Inspector's report also noted that the effects of noise, dust, and disturbance were improbable given the distance between the two Natura 2000 sites and the Site. The Applicant maintained that this direction was invalid for several reasons, the most fundamental of which was the Applicant's claim that a quarry which stays within its pre-1964 use is not subject to the Directives because it does not require development consent; this being, it maintained a condition of the applicability of the Directives.

ABP upheld MCC's decision. The applicants maintained that ABP's decision was also invalid. They maintained that section 261A of the Planning and Development Act 2000 was unconstitutional in failing to provide for adequate procedures in a process which, they said, wrongly and unfairly removed rights which were "vested" in it pre-1964.

The applicants sought the following reliefs:

(i) an order of certiorari quashing the decision of ABP, dated 27th June 2013, wherein ABP purported to make a determination pursuant to section 261A, confirming the earlier determination of MCC on 20th July 2012;

(ii) an order of certiorari quashing the decision of MCC made pursuant to section 261A on 20th July 2012; and,

(iii) a declaration that section 261A is unconstitutional.

On 20th April 2020, the judgement of Ms. Justice Ní Raifeartaigh [23] rejected the submission that a quarry which commenced operations prior to 1964, even one which stays within its pre-1964 use, is automatically by virtue of that use, rendered immune from the Directives. She rejected the submission that MCC was not entitled to issue a direction to the applicants to apply for substitute consent in circumstances where it had previously imposed conditions which envisaged further quarrying for 20 years following the quarry's registration under Section 261. She also found that the legislation was not unconstitutional for the reasons put forward by the applicants.

Following the judgement, MOR Environmental was contracted in Q4 2024 to prepare a remedial EIAR ('rEIAR') and remedial AA ('rAA') to support a Substitute Consent planning application for the Site.

This planning application, inclusive of the required rEIAR and rAA, was submitted to ABP by MOR Environmental on 31st March 2025 to obtain permission for historical works at the quarry (case number ABP-322189-25). The Substitute Consent is being sought under Section 177E of the Planning and Development Act 2000, as amended, to regularise quarrying activities carried out up to March 2025.

2.4 Policy Context

The Proposed Development has been reviewed considering national, regional and industrial policies within this section.

2.4.1 National Policy

In 2018, the Government of Ireland released Project Ireland 2040, its overall strategic plan for managing a projected population growth of one million people (a 20% rise) by 2040 in a planned, productive and sustainable manner. Two headline documents were produced:

- The National Planning Framework ('NPF') [24]; and,
- The National Development Plan 2021-2030 ('NDP') [25].

The document recognises the importance of the extractive sector, stating:

> *"Extractive industries are important for the supply of aggregates and construction materials and minerals to a variety of sectors, for both domestic requirements and for export. The planning process will play a key role in realising the potential of the extractive industries sector by identifying and protecting important reserves of aggregates and minerals from development that might prejudice their utilisation. Aggregates and minerals extraction will continue to be enabled where this is compatible with the protection of the environment in terms of noise, air and water quality, natural and cultural heritage, the quality of life of residents in the vicinity, and provides for appropriate site rehabilitation."*

Within NPF2040 there are ten National Strategic Outcomes ('NSOs'), of which NSO9 'Sustainable Management of Water, Waste and other Environmental Resources' states that:

> *"Ireland has abundant natural and environmental resources such as our water sources that are critical to our environmental and economic well-being into the future. Conserving and enhancing the quality of these resources will also become more important in a crowded and competitive world as well as our capacity to create beneficial uses from products previously considered as waste, creating circular economic benefits."*

The NPF sets out National Policy Objectives ('NPOs'). These objectives were developed as a result of extensive analysis and consultation and set a new way forward for regional and local planning and sustainable development policy in Ireland. These objectives are highlighted throughout the NPF document and are listed in Appendix 1 of the document.

National Policy Objective ('NPO') 23 directly relates to the aggregates and minerals and aims to:

> *"Facilitate the development of the rural economy through supporting a sustainable and economically efficient agricultural and food sector, together with forestry, fishing and aquaculture, energy and extractive industries, the bio-economy and diversification into alternative on-farm and off-farm activities, while at the same time noting the importance of maintaining and protecting biodiversity and the natural landscape and built heritage which are vital to rural tourism.*

In addition to the above, the NPF2040 recognises that aggregate supply is essential for the fulfilment of the housing goals within the 2040 Plan, and states:

> *"…the Housing Agency has identified an aggregate need for at least 45,000 new homes in Dublin, Cork, Limerick, Galway and Waterford up to 2020…In the longer term to 2040, there will be a need for provision of at least 275,000 new homes in the cities, with half of these located in already built-up areas."*

The NDP estimates that the public investments in infrastructure, etc. laid out in the NDP will sustain up to 80,754 direct and indirect construction jobs per annum over the lifetime of the

plan. It outlines the intent to deliver approximately 33,000 new homes on average, including an average of 10,000 new social homes and an average of 6,000 affordable homes per year. The NDP also aims to improve regional accessibility through enhanced public infrastructure and outlines multiple National Road projects to improve connectivity and accessibility.

2.4.2 Industrial Policy

Subsequent to the launch of Project Ireland 2040, the Irish Concrete Federation ('ICF') produced its own report: *"Essential Aggregates: Providing For Ireland's Needs to 2040"* [26]. The report highlights the importance of aggregates as identified in the NPF2040 and states:

> *"It is essential that the importance of aggregates and aggregate-based products to Ireland's future is recognised by the Government and that Ireland's strategic reserves of aggregates are identified and protected and their use enabled in a sustainable manner. It is equally important that the quarrying industry plays its part in ensuring that operations are carried out in a sustainable manner and that the state's planning enforcement and procurement functions ensure that only authorised operators are entitled to supply the marketplace."*

The document estimates that to fulfil the national housing aims of NPF2040, the industry will need to supply approximately 1.5 billion tonnes of aggregate and stresses that:

> *"Scarcities of some particular aggregate products are already emerging in the eastern and midland regions. Therefore, the future supply of aggregates needs to be planned, monitored and managed in a sustainable manner."*

The ICF report also states that:

> *"To provide for the country's future development, Ireland's strategic reserves of aggregates need to be identified, quantified and protected."*

2.4.3 Regional Policy

County Meath lies within the Eastern and Midland Region Assembly ('EMRA'), which is also inclusive of the following counties: Louth, Kildare, Wicklow, Westmeath, Longford, Offaly, and Laois. The EMRA is one of three regional assemblies in the Republic of Ireland. The total population of the EMRA in 2022 was 981,200, according to the census of that year [27]. County Meath is part of the Regional Spatial and Economic Strategy ('RSES') 2019-2031 for the EMRA, which acts as a strategic link for frameworks between the NPF and the MCC Plan [28].

MCC has a statutory obligation to secure the implementation of the objectives of the Plan, including:

The EMRA produced the current RSES 2019-2031 [29], which:

> *"Builds on the foundations of Government policy in Project Ireland 2040, which combines spatial planning with capital investment, and has been prepared from an extensive bottom-up consultation process."*

Within the RSES, the Regional Assembly states that the Region states that:

> *"The RSES is tasked with the development of planning and economic development policy for future needs in the Region based upon consideration of the availability of land, resources, environment and infrastructure capacity.";*

And that:

> *"We depend on our natural resources to protect public health, the environment, amenities and to sustain employment in sectors such as agri-food and tourism, particularly in rural Ireland."*

The RSES acknowledges that the natural capital of the region, which includes geological resources, supports numerous sectors across the region, including construction.

Regional Planning Objective 6.7 is to:

> *"Support local authorities to develop sustainable and economically efficient rural economies through initiatives to enhance sectors such as agricultural and food, forestry, fishing and aquaculture, energy and extractive industries…"*

The RSES outlines the need for various infrastructure projects. These include infrastructure relating to housing and population needs within sectors such as renewable energy, tourism, and transport. The RSES acknowledges the importance of sustainable rural economy and states that:

> *"The rejuvenation of rural towns and villages requires that appropriate job creation can be supported in rural areas. Traditional sectors such as agriculture, tourism, extractive industries and forestry are complemented by diversification in sectors such as food, renewable energy and opportunities provided from improved digital connectivity."*

2.4.4 Local Policy – Meath County Development Plan

The Meath County Development Plan 2021-2027 ('CDP') was adopted by MCC on 22nd September 2021 and was superseded with an updated version, which was adopted on 27th January 2025 [8]. The CDP serves as a plan for guiding the future development and growth of the county. Its primary purpose is to set out objectives and policies that will shape decisions on various aspects of development within the county.

2.4.4.1 Local Population Policy

The CDP [8] predicts a population growth within the county up to 227,500 in 2026. The difference between the projected 2026 population for the county and the projected 2031 population is 4,000, with a population of 231,500 predicted for 2031.

Oldcastle, the nearest town to the Site (ca. 5.5km north of the Site), is designated as a 'Strong Rural Area' in the Kells Municipal District. The CDP contains specific development objectives for Strong Rural Areas. The Site falls within the developmental envelope of Oldcastle and, therefore, is subject to such objectives as:

> *"To consolidate and sustain the stability of the rural population and to strive to achieve a balance between development activity in urban areas and villages and the wider rural area"*; and,
>
> *"To facilitate the housing requirements of the rural community as identified while directing urban generated housing to areas zoned for new housing development in towns and villages in the area of the development plan."*

2.4.4.2 Local Infrastructure Policy

At a strategic level, the NPF and RSES recognise the importance of high-quality infrastructure and recognises the role of Meath in providing essential functions and services that support societal, economic and environmental systems at local, regional and national levels [29]. A Local Area Plan ('LAP') has been prepared for the town of Oldcastle within the CDP. MCC aim to provide, maintain and enhance road infrastructure to ensure the sustainable economic development of the County. The CDP outlines a number of road infrastructure projects aimed at enhancing the existing road network and connectivity of the county.

According to the CDP:

"The County is very reliant on its road infrastructure for intra and inter county movement and access."

The CDP includes the following policies for road infrastructure that are relevant to the Proposed Development:

MOV POL 24 *To safeguard the capacity and safety of the National road network by applying the provisions of the Department of Environment Community and Local Governments – 'Spatial Planning and National Roads-Guidelines for Planning Authorities, 2012' to avoid the creation of any additional development access to national roads and intensification of existing access to national roads to which speed limits greater than 60kph apply, save in accordance with agreed 'exceptional circumstances' included in MOV POL 33.*

MOV POL 26 *To provide for and carry out improvements to sections of national, regional and county roads that are deficient in terms of alignment, structural condition or capacity, where resources permit, and to seek to maintain that standard thereafter. To ensure that, where possible, any maintenance and improvement strategies have regard to future climates.*

The CDP includes the following objectives for road infrastructure that are relevant to the Proposed Development:

MOV OBJ 39 *To facilitate the delivery of all roads projects outlined in the National Development Plan 2018-2027 and National Transport Authority's Transport Strategy for the GDA 2016-2035, in conjunction with the NTA, TII, Department of Transport and other stakeholders. Development of these road projects will be subject to the outcome of the Appropriate Assessment process.*

MOV OBJ 45 *To work in conjunction with Cavan County Council in the planning and delivery of the N3 Virginia Bypass Scheme located within the administrative area of Meath County Council. This project will be subject to the outcome of the Appropriate Assessment process.*

MOV OBJ 48 *To implement maintenance and improvement of roads in the County as set out in the Schedule of Municipal District Works and the Council's Annual Roadwork's Programme funded from the Council's own resources and State Agency grants.*

MOV OBJ 49 *To support essential public road infrastructure including, bypasses of local towns and villages and proposed national road schemes and where necessary reserve the corridors of any such proposed routes free of development, which would interfere with the provision of such proposals. Such road schemes include those specified in the non-exhaustive list in Table 5.1: Each of these projects will subject to the outcome of the Appropriate Assessment process.*

MOV OBJ 50 *To continue to deliver targeted capacity road upgrades within the County to eliminate congestion blackspots.*

MOV OBJ 52 *To continue to support the delivery of key strategic roads within Dunboyne to include an eastern distributor road to facilitate rail-focused development, new bus routes and reduce traffic levels in the town.*

MOV OBJ 53 *To promote the delivery of key strategic roads in the Key Town of Navan to include but not limited to: 1) link road from Dublin road to Trim road, 2) distributor road from R153 at Farganstown and future bridge across the River Boyne to N51 and North Navan 3) link road from Rathaldron road to R147 inclusive of bridge across the Blackwater 4)Trim Road to N3 Kilcarn Road, 5) Commons Road to N51 Athboy Road, (6) N51 Athboy Road to Rathaldron*

Road. Each of these projects will subject to the outcome of the Appropriate Assessment process.

MOV OBJ 54 *To work in conjunction with Kildare County Council to deliver the section of the Maynooth Outer Relief Road located within the administrative area of Meath County Council.*

MOV OBJ 54 *To promote the delivery of the following key strategic roads included but not limited to: Ratoath Outer Relief Road, Bryanstown Link Road (Drogheda), Navan Road – Dublin Road Link, Trim, M3 Junction 6/R125 to R147 distributor road. Each of these projects will subject to the outcome of the Appropriate Assessment process.*

MCC aim to provide, maintain and enhance road infrastructure to ensure the sustainable economic development of the County.

2.4.4.3 Local Extractive Industry Policy

The CDP acknowledges the importance of the extractive industry within Co. Meath and its potential for environmental impacts:

> *"Meath County Council acknowledges the need for extractive industries in terms of supply of aggregate materials for the construction sector, delivering transport infrastructure projects, and for the export market. However, the potential for conflict in the operation of these industries with wider environmental issues needs careful consideration. By their nature, aggregates can only be worked where they occur. The cost of haulage affects economic competitiveness in this sector. This inevitably leads to conflicts and environmental concerns. Extractive industries by their nature can give rise to detrimental environmental and residential amenity effects including traffic generation, vibration, dust, noise, water pollution, visual intrusion and loss of ground water supplies. The impact on the road network of the County is significant."*

It is the goal of MCC:

> "*To facilitate adequate supplies of aggregate resources to meet the future growth needs of the County and the wider region while addressing key environmental, traffic and social impacts and details of rehabilitation"*

The CDP includes the following policies for the extraction industry:

RD POL 21 *To ensure that projects associated with the extractive industry carry out screening for Appropriate Assessment in accordance with Article 6(3) of the E.C. Habitats Directive, where required.*

RD POL 22 *To facilitate the exploitation of the county's natural resources and to exercise appropriate control over the types of development taking place in areas containing proven deposits, whilst also ensuring that such developments are carried out in a manner which would not unduly impinge on the visual amenity or environmental quality in the area.*

RD POL 23 *To support the extractive industry where it would not unduly compromise the environmental quality of the county and where detailed rehabilitation proposals are provided.*

RD POL 24 *To seek to ensure that the extraction of minerals and aggregates minimise the detraction from the visual quality of the landscape and do not adversely affect the environment or adjoining existing land uses.*

RD POL 25 *To ensure that the extractive industry and associated development minimises adverse impacts on the road network in the area and that the full cost of road improvements, including during operations and at time of closure, which are necessary to facilitate those industries are borne by the industry itself.*

RD POL 26 *To ensure that all existing workings shall be rehabilitated to suitable land uses and that all future extraction activities will allow for the rehabilitation of pits and proper land use management. The biodiversity value of the site should be considered in the first instance when preparing restoration plans. Where landfilling is proposed, inert material is the preferred method. Each planning application shall be considered on a case by case basis and where relevant will be dealt with under the relevant regional Waste Management Plan.*

RD POL 27 *To ensure that development for aggregates / mineral extraction, processing and associated processes does not significantly impact in the following areas:*

i. *Existing & Proposed Special Areas of Conservation (SACs)*
ii. *Special Protection Areas (SPAs)*
iii. *Natural Heritage Areas and Proposed Natural Heritage Areas*
iv. *Other areas of importance for the conservation of flora and fauna*
v. *Areas of significant archaeological potential;*
vi. *In the vicinity of a recorded monument, and: Sensitive landscape*
vii. *World Heritage Sites.*

This EIAR will enable the application to comply with these requirements from MCC.

2.5 Need For Development

Due to Ireland's infrastructural deficit and dispersed pattern of settlement and large road network, the current demand in Ireland for aggregates-based product consumption (aggregates, concrete, asphalt) is in the range of 12 - 15 tonnes per capita, approximately twice the EU average [26]. The NPF 2040 sets out a target of sustainable growth of Ireland's rural communities, with approximately 50% of the projected population growth to 2040 intended to occur outside of the five major Irish cities (Dublin, Cork, Galway, Limerick and Waterford). Of this 50%, a minimum of 30% (15% of total population growth) is planned to occur within the existing built-up footprint of current settlements. The projected growth requires new infrastructure, including housing, schools, public services and transport networks. Regional policy seeks to make efficient use of the region's natural resources and to carry out major developments within the framework of national policy. From a local sense, ambitious goals set by MCC concerning housing and public infrastructure, particularly road infrastructure, will not be attainable without a sufficient source of suitably situated quality aggregates and construction products. The Site has historically positively contributed to aggregate production in Ireland, which has given rise to the trend observed today of an increased aggregate demand.

Even within the context of a circular economic model, projected growth will require substantial quantities of materials, including aggregates, and the intended rural growth means that the market for building materials will have a strong regional and local element, which has historically been the case for the Site. The potential scarcity in the midland and eastern region (as highlighted in the ICF report [26]) increases the importance of supplies from other regions, such as the Site in question.

The Site and its associated development would continue to facilitate County Meath's future development by providing high-quality sand and gravel products to the construction industry.

Thus, they would reduce the need for importing material and construction products from outside the county, potentially reducing pressure on regional and national supplies.

The Site and associated development have facilitated the local area's economy through direct local employment. If the Site cannot be brought into compliance, the long-term future of the Site and associated jobs are at risk.

The policies and objectives of the local and strategic plans for the Eastern and Midlands Region, as outlined in Section 2.4 above, target the economic and infrastructural development of the region. These plans will require the supply of good-quality aggregate material from a selection of competitive quarry operators and quarry sites. It is considered that the Proposed Development is aligned with the objectives / policies of the NPF, NDP, RSES, and CDP.

3 DESCRIPTION OF THE PROPOSED DEVELOPMENT

3.1 Introduction

This chapter describes the operational activities which occur and have occurred within the Site. See Figure 1-2 in Section 1.3 of Chapter 1 of this EIAR for the boundaries of the Site. Figure 3-1 below shows the Site infrastructure.

The Site has a total area of ca. 40.12 ha, and it has a long history of quarrying, with evidence of pre-1963 origins. The Site has been in the possession of the Applicant's family since the commencement of works and continues to be in regular use.

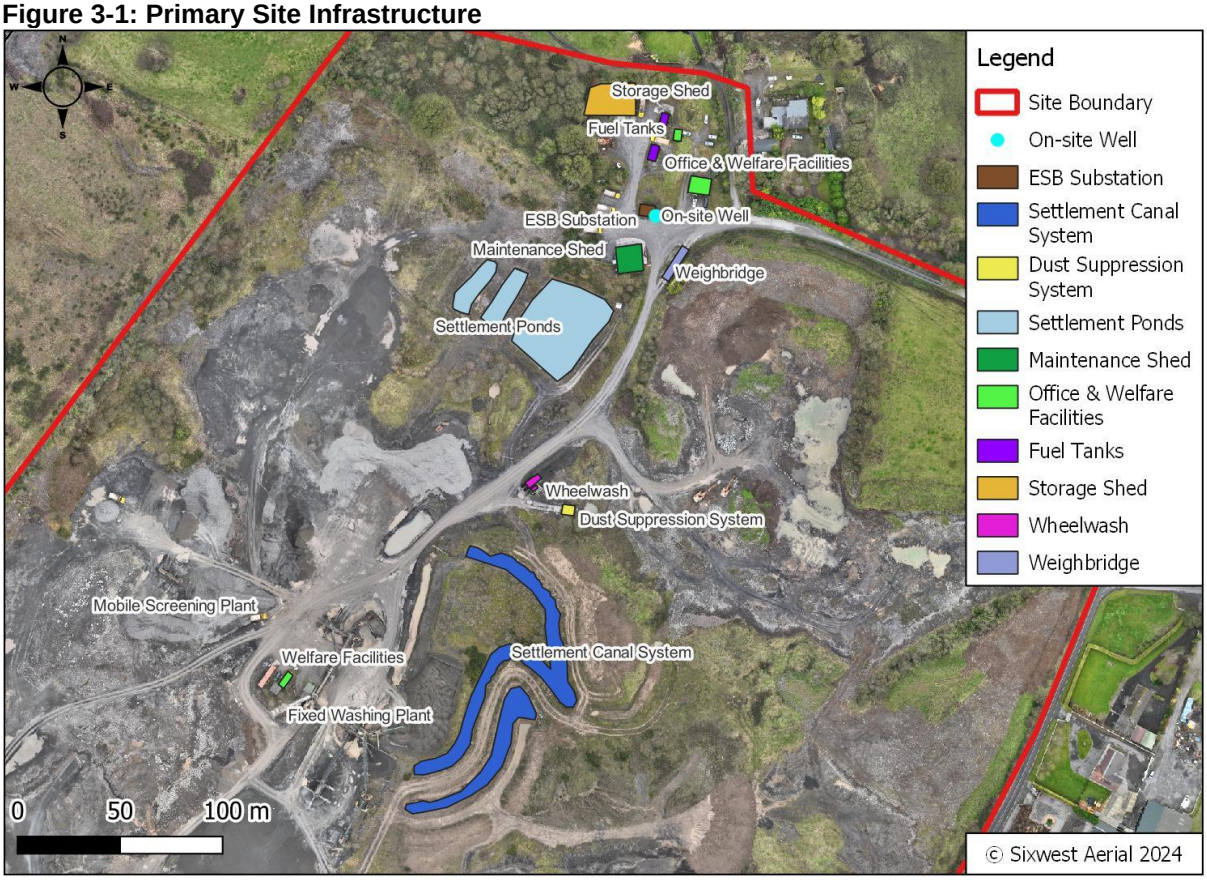
The entrance gate to the Site is off the R195 regional road on the east boundary. The Site office and welfare facilities, storage shed, maintenance shed, fuel tanks and vehicle parking are located in the northern portion of the Site. The Site is comprised of the following infrastructure:

- Extraction area;
- Dry mobile screening plant;
- Aggregate washing plant;
- Semi-mobile crushing plant;
- Settlement canal system;
- Associated settlement ponds;
- Stockpiles of aggregate;
- Site access road;
- On-site haulage routes;
- Site office and toilets (ca. 77m^2);
- Wastewater treatment and percolation;
- Storage shed (ca. 375m^2);
- Maintenance Shed (ca. 164m^2);
- Two fuel tanks (ca. 153m^3);
- Vehicle parking;
- Weighbridge; and,
- Aggregate additives for making 'arena footing'.

Stockpiles are present throughout the quarry floor, and the settlement canal system is located in the centre of the Site.

The Site generally comprises an extensive quarry floor with haul routes extending to the aforementioned screening plant and equipment. Figure 3-1 below details the primary site infrastructure.

Figure 3-1: Primary Site Infrastructure



3.1.1 Historic Activities

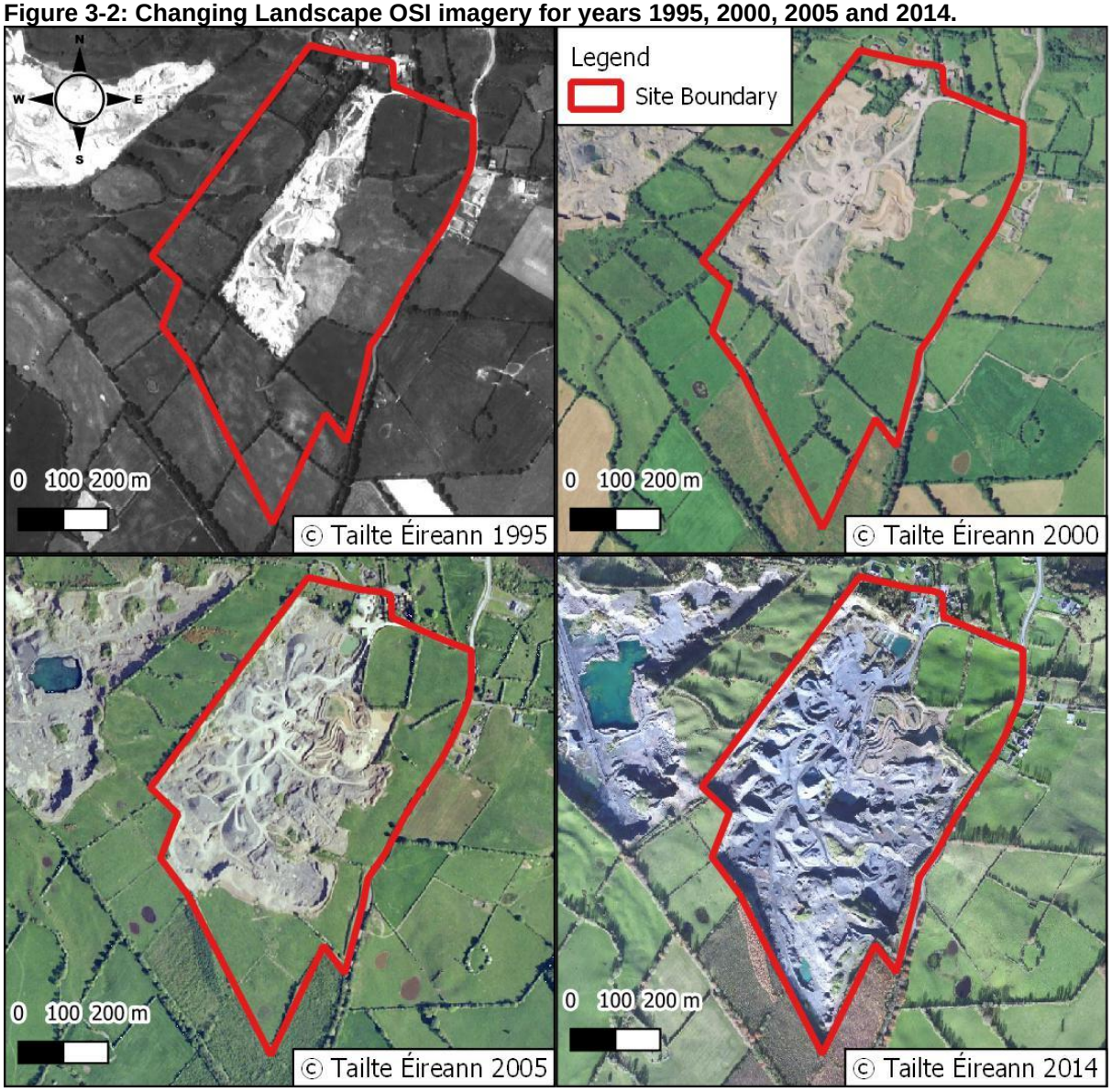
The quarry is a recognised pre-1963 development, with a fixed plant erected on the Site and current crushing and processing arrangements dating back to the early 1970s. Aggregates were extracted using conventional excavating and shovelling methods, which fragmented the rock to manageable sizes. Plant and machinery that operated at the quarry consisted of tracked excavators and dump trucks that transported material. Ancillary plants, such as a tractor and bowser, were deployed when required.

OSI aerial photography was observed for the years 1995, 2000, 2005, and 2014. Figure 3-2 below shows an aerial image from each of these years. The exposed land increased from 1995 to 2014, with the exposed ground area increasing approximately threefold.

Based on the 1995 imagery, the exposed ground area was ca. 8.0ha. By the imagery shown in 2000, the exposed area is ca. 15.2ha, increasing to ca. 24.0ha in 2005 and ca. 32.5ha in 2014.

The aerial photography from 2014 shows the Site much as it is now, though further depths of extraction have since arisen. Figure 3-2 below shows the Proposed Development redline boundary overlain on the OSI imagery.

Figure 3-2: Changing Landscape OSI imagery for years 1995, 2000, 2005 and 2014.



Processing consists of the breaking of the excavated rock and the repeated crushing and screening of the aggregate to produce the required aggregate sizes. This requires the use of various plant such as tracked excavators, rubber tyred loading shovels and a variety of crushers and screeners.

3.1.2 Current Activities

Work at the Site has been restricted until the application for substitute consent, case reference number ABP-322189-25, is determined and further authorised for prospective development, through the submission of this EIAR, with existing open areas of partial development being worked above the water table only, as well as substantial historical stockpiles.

The current active sand and gravel pit is currently being processed, but at a reduced scale compared to historic production levels. Currently, aggregates are being sourced from extensive onsite stockpiles until substitute consent is brought into compliance and the Site is further authorised for prospective development, pending this application.

3.1.3 Screening

The eastern boundary consists of a high bank, separating the Site from the road. The L68185 local road climbs to the north, and the Site is partially visible. To the south, the land use is largely agricultural and forestry, and natural, undulating topography screens the Site. To the west of the Site, an adjacent quarry and associated works owned by BD Flood are separated by a ridge of land left at its original ground level with fencing and hedgerows on the top. Further details on visual impact assessment are presented in Chapter 12.

3.2 Overview of the Proposed Development

The Proposed Development will include the future development and restoration of the existing quarry and extension into a 1.02 hectare greenfield. Future development of the quarry will involve continuing quarrying activities within the 40.12ha Site, with deepening in two areas of the Site, ca. 6.35ha, to the existing pit floor of 119mOD, site preparation works, and restoration works over the full Site. A project life of 20 years is being sought to complete all works. The works required for the Proposed Development will have three distinct stages:

- Stage 1 – Site preparation;
- Stage 2 – Site operation; and,
- Stage 3 – Restoration.

Unlike a greenfield development or extension, most of the Site is already exposed and prepared for operational works. As such, soil stripping under Stage 1 Site preparation will only be relevant to the greenfield elements located on the northeastern boundary. However, within the proposed works areas, several ponds are present, and preparation works will also include the development of new ponds within the Site to enable the closure of these existing ponds. Full details and methodologies are presented in Chapter 6 - Biodiversity.

Similarly, Stage 3 Restoration works will commence within areas of the Site where future reserves are not sought and will run in tandem with Stage 2 operational activities elsewhere on the Site.

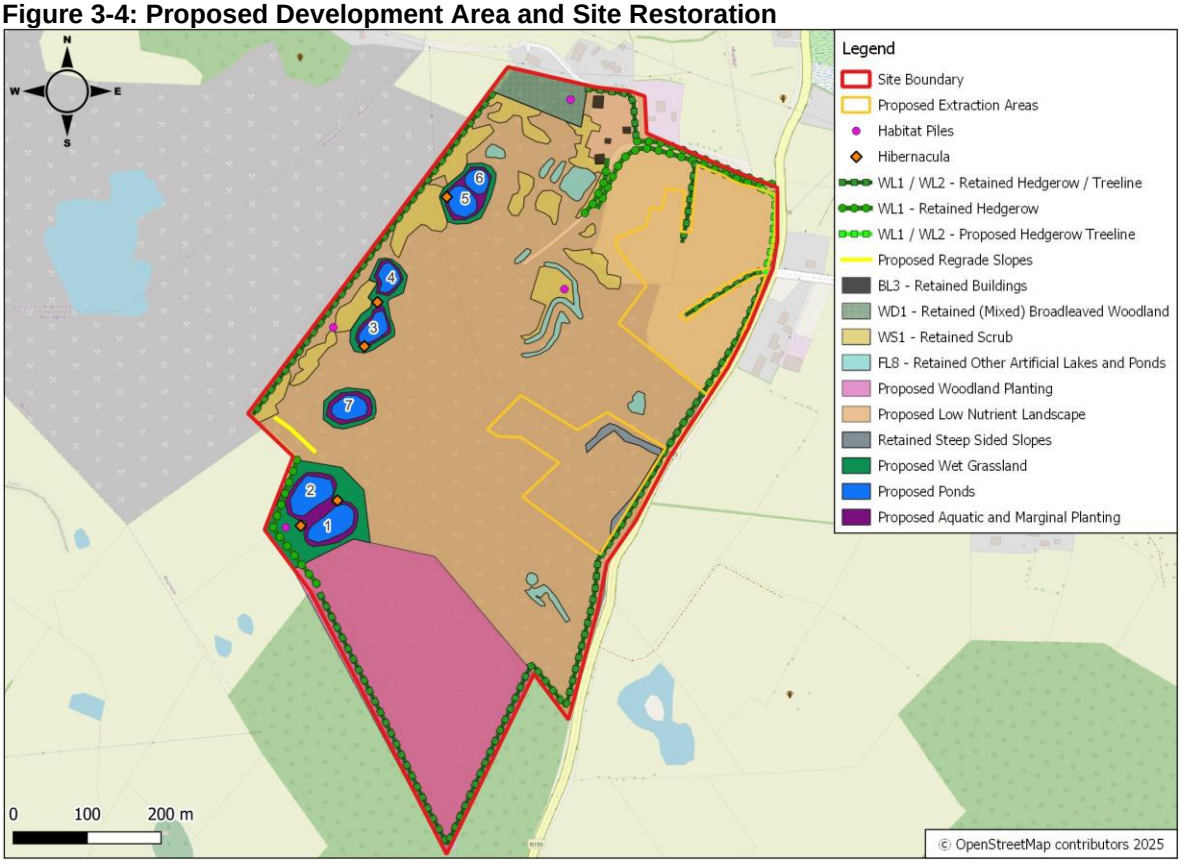
Stage 2 site operations will be subdivided into specific phases, covering the removal of existing stockpiles, and the deepening of the quarry in two distinct areas within the site.

The Proposed Development will consist of the following works:

- Future extraction in designated areas as shown in Figure 3-3 below;
- Continued use of the current operational facilities on the Site, e.g., buildings, machinery, roadways, the settlement canal and the settlement ponds; and,
- Restoration works in the south and west of the existing Site as shown in Figure 3-4 below.

Figure 3-3: Future Extraction Areas

Figure 3-4: Proposed Development Area and Site Restoration



3.3 Development Phasing

The Proposed Development will be split into three stages, as described below. Works related to individual stages will co-occur.

3.3.1 Stage 1 – Phase 1 – Pond Construction

Prior to commencement of aggregate extraction within areas where existing ponds are located, replacement ponds will be constructed within the areas proposed for immediate reinstatement. Any protected species present within the existing ponds will be transferred to the newly constructed ponds under appropriate licensing, if required, prior to any excavation works taking place - refer to Chapter 6 Biodiversity for more information.

3.3.2 Stage 1 – Phase 2 - Site Preparation

Before the commencement of aggregate extraction, the Site must be prepared accordingly. This stage will include preparing a grassland area at the northeastern section of the Site for aggregate processing activities. Work will consist of stripping the topsoil and excavation of sand and gravel subsoils.

The Site preparation works will be undertaken by the Applicant and will include the following:

- Vegetation clearance where necessary; and,
- Removal of topsoil.

The Quarry is currently secured with boundary fencing and an established site entrance to the north. Fencing that encompasses the Site will include safety signage at regular intervals to ensure personnel approaching the Site can clearly understand the dangers associated with activities at the Site.

Furthermore, the general infrastructure required for the Proposed Development is currently in place within the Quarry. The Proposed Development will utilise existing ancillary infrastructure, thereby reducing the potential effects associated with the site preparation phase.

The existing treelines in the northeast of the quarry will be untouched and are excluded from the future extraction area presented in Figure 3-3 above.

3.3.3 Stage 2 – Phase 1 Stockpile removal

Removal of existing aggregate stockpiles throughout the Site will also take place and will be a gradual process based on aggregate demand. Stockpiles within areas to be reinstated will be removed first, and the land will be prepared for reinstatement following this. Should aggregate demand reduce for any reason, stockpiles which are currently stored in areas to be reinstated will be moved to the Proposed Development area of the quarry, so there is no time delay in carrying out the reinstatement works.

3.3.4 Stage 2 - Phase 2 – Extension and Levelling of Quarry Floor in the North of the Site

After site preparation works (Stage 1) are completed, extraction activities will continue at the Site within designated areas, as shown in Figure 3-3 above. The designated extraction area in the north of the quarry will include:

- Continued excavation of viable sand, gravel and soft rock aggregate within the existing quarry footprint;
- Extension of the quarry into the field to the northwest of the Site;
- Levelling of the excavation area to a maximum depth of 119 metres Ordnance Datum (‘mOD’); and,

- Storage of sand and gravel aggregate stockpiles within the designated working area of the quarry.

3.3.5 Stage 2 - Phase 3 – Deepening and Levelling of Quarry Floor in the East of the Site

After the completion of site preparation works (Stage 1), extraction activities will continue at the Site within designated areas, as shown in Figure 3-4. The designated extraction area in the east of the quarry will include:

- Continued excavation of viable rock aggregate within the existing quarry footprint;
- Levelling of the excavation area to a maximum depth of 119 mOD; and,
- Storage of rock aggregate stockpiles within the designated working area of the quarry.

Plant used as part of the Phase 2 and Phase 3 works will include the continued use of existing machinery on site, such as the washing plant and associated water management system, the mobile screening and crushing plant, excavators with breakers and shovels and loading shovels.

3.3.6 Stage 3 – Phase 1 – Immediate Reinstatement/ Restoration

Immediate restoration of sections of the existing Site footprint will be carried out as part of the Proposed Development. This will take place predominantly in the south and west of the existing quarry Site. Works will be carried out in designated reinstatement areas of the existing quarry footprint where stockpiles have been removed and no further activity (i.e. stockpile storage and excavation) will be taking place. Hence, any immediate restoration works will be carried out outside of the future extraction and operational activities areas and in line with the restoration plan presented in Chapter 6 – Biodiversity (refer to Figure 3-4 above and Figure 6-8 in Chapter 6).

There are currently a number of stockpiles of soil which have been stored on the Site for restoration purposes. During the immediate restoration works, these will be spread across the designated reinstatement areas to provide a thin soil layer over the existing ground. The importation of clean, uncontaminated soil will likely be required as part of this stage of the project. The volume of imported soil will not affect overall traffic numbers at the Site. It will occur when reduced deliveries of aggregate from the Site to the market are occurring. The imported soils will be inert, by-product material only, and are required in order to achieve the restoration goals outlined in the Restoration Plan, presented in Chapter 6 - Biodiversity.

Restoration works to be carried out immediately and in tandem with the Stage 1 and Stage 2 works described above, including the creation of various habitats and the restoration of the quarry habitat to a low-nutrient landscape. The habitats to be created include:

- Ponds and wetland areas in the southwest and west of the existing quarry Site;
- Wet meadows around the ponds;
- A woodland in the south of the existing quarry Site; and,
- A low nutrient habitat across the south and west of the existing quarry Site.

3.3.7 Stage 3 – Phase 3 – Future Reinstatement / Restoration

Restoration for the remainder of the Site will be undertaken following completion of the operational stage of the Proposed Development. This will take place predominantly in the centre, north and east of the Site and in line with the restoration plan presented in Chapter 6 – Biodiversity (refer to Figure 3-4 above and Figure 6-8 within Chapter 6).

All plant equipment will be removed from the Site. Buildings and associated utility infrastructure shall remain in place to accommodate potential future development opportunities.

Any future stockpiles of soil stored on Site for restoration purposes will be spread across the Proposed Development area to provide a thin soil layer over the ground. The importation of clean, uncontaminated soil will likely be required as part of this phase of the restoration works.

The Site will be restored to a low-nutrient habitat that is expected to develop into a species-rich, semi-natural grassland community.

3.4 Proposed Development Project Goals

The goals associated with each stage and within the phasing of each stage will change. These are outlined below.

3.4.1 Construction Stage – Stage 1

The construction stage of the Proposed Development will include the following goals:

- Vegetation clearance, removal of topsoil and preparation of new land for excavation activities; and,
- Construction of new ponds, preparation of land for reinstatement works within designated areas of the existing quarry footprint, and reinstatement works within these areas as per the reinstatement plan (refer to Figure 3-3 above).

3.4.2 Operational Stage – Stage 2

The Site is a well-established quarry operation. The Proposed Development will operate in a similar manner to past extraction activities at the Site. This includes continued use of existing plant and machinery, excavation and stockpiling of newly excavated aggregate in a similar manner to how aggregate has previously been stockpiled, and exportation of material off site in volumes which are in line with tonnage volumes previously reported.

The operational stage of the Proposed Development will include the following goals:

- Phase 1 – removal of stockpiles across the Site;
- Phase 2 – extraction of viable sand, gravel and soft rock aggregate and levelling of the extraction area to 119mOD; and,
- Phase 3 – extraction of viable rock aggregate and levelling of the extraction area to 119mOD.

3.4.2.1 Crushing / Screening and Stockpiling of Aggregate

The sand, gravel and rock aggregate will be collected by either a front-end loader or dumper and transported to the fixed washing plant, which will remain at its current location. The plant will screen the aggregate into pre-selected sizes / grades and generate stockpiles of the graded aggregate through a mechanical process.

3.4.2.2 Export of Material

Aggregate will be exported from the Quarry by HGVs. Table 3-1 below provides an overview of the existing maximum permitted daily trips from HGVs associated with the Quarry, as well as movement associated with light vehicles such as cars and vans. The Proposed Development will operate within these numbers.

Table 3-1: Summary of Existing Daily Trips

Type of Traffic	Daily Trips		
	Arrivals	Departures	Total
Exported Quarried Material (HGVs)	16	16	32
Staff (LVs)	9	9	18
Total	25	25	50

3.4.3 Restoration Stage – Stage 3

The restoration stage of the Proposed Development will involve the reinstatement of the quarry. This will include the future extraction areas and the operational areas of the quarry. The restoration plan submitted as part of the substitute consent application (ABP reference number 322189-25) and presented in Appendix 3-1 of this EIAR will be modified to accommodate additional pond development, arising from the loss of existing ponds in the proposed extraction areas. The restoration plan will also be supported with inert non-waste soil imported from suitable off-site locations to supplement the historic soil stockpiled on the site and the soils removed from the proposed approximately 1-hectare field to be stripped in the northeast.

The Restoration Plan submitted as part of this application (presented in Section 6.7 of Chapter 6 of this EIAR) supersedes the previous restoration plan for the Quarry as submitted to ABP under case file ABP-322189-25.

The Site will be made safe and engineered to enable the development of a biodiverse habitat. This will involve the following works:

- Removal of all plant and equipment;
- Boundary fencing will be inspected and improved where necessary to prevent unauthorised access; and,
- It is proposed to maintain the hardstanding area adjacent to the Site offices for light industrial use. The use of this area will be subject to securing the necessary planning permission for a change of use when quarry works are complete.

The Restoration Plan will provide a mosaic of habitats onsite, refer to Figure 3-4 above for context.

3.4.4 Scale of the Proposed Development

The area of the Site is ca. 40.12ha in size. As part of the Proposed Development, a portion of the Site will be reinstated while the remaining portion of the Site will continue to be used for quarrying activities. Stockpiles will be removed from across the Site, and the lands will be restored. Additional excavation works will occur over an area of 6.35Ha within the Site, which includes soil stripping of 1.02Ha of land.

It is proposed to export aggregates in line with the current exportation figures which will result in no increase to the operations of the Site. Between March 1998 and March 2025, exports averaged 194,323 tonnes per year, however the volume of exported material will be dependent on market conditions.

The proposed operational life for the development is 20 years, which includes ongoing and final restoration work but excludes maintenance work afterwards. No quarrying or heavy machinery will be required beyond year 18.

The Proposed Development will be completed in phases. Cross sections of the Proposed Development's finished extraction levels are included in Drawing No. MM250507-12 and Drawing No. MM250507-15, as presented in Appendix 3-2.

3.5 The Site and Associated Activities

The Site has sufficient infrastructure to support the Proposed Development. See below for details of key infrastructure elements.

3.5.1 Working Hours

Operational hours associated with the Site are:

- Monday to Friday 07:00 – 19:00;
- Saturday 07:00 – 14:00; and,
- Sunday & Public Holidays closed.

3.5.2 Staffing Numbers

Peak employment at the Site totalled to ca. 26 persons from 2007-2008. The Site currently employs ca. nine full-time onsite employees, reflecting the subsistence operations pending regularisation and prospective permission.

3.5.3 Drainage

Surface water run-off is collected in the onsite canal settlement system and settlement lagoons located in the centre and the northern section of the Site. Water is pumped from the settlement pond system north of the quarry floor to the screening plant in the centre of the Site, which is then collected at the settlement canal and pumped back to the northern settlement pond. A hydrological / hydrogeological assessment has been carried out on the Site, considering the current water regime. For further details, see Chapter 8 – Water.

3.5.4 Fuel and Oil Storage

Fuel is stored at the northern section of the Site and dispensed directly into the plant and vehicles or transported by mobile bowsers to the plant onsite. The Applicant uses regulated suppliers to transport fuel to the Site, who either dispense directly into the plant or fuel storage tanks.

Fuel is stored in two purpose-built bunded tanks adjacent to a garage/maintenance shed building. All on-site mobile plant and equipment are refuelled on the concrete plinth next to the fuel garage by trained personnel with suitable drip trays and easy access to emergency spill kits.

Oils and other maintenance liquids are stored in the main Site garage close to the northern Site boundary, on hard-standing, in barrels and other bunded/double-skinned/drip tray containers.

Oil or lubricant changes or routine wheeled or tracked plant servicing are undertaken within suitable garage facilities. HGVs and other non-site vehicles are refuelled off-site. Site fuel storage is, thus, principally for fuelling operational plant, excavators, and loading shovels.

3.5.5 Wheel wash

The wheel wash is comprised of a concrete-lined depression and an overhead sprinkler system, which is located north of the canal settlement system. Water is pumped from the northern settlement system to the wheel wash, and washings are filtrated back to the settlement system. The wheel wash is routinely maintained.

3.5.6 Water Supply

Wastewater for onsite amenities (kitchen, toilets, sinks, etc.) is treated privately onsite. The wastewater is collected through a wastewater pipeline network and directed toward a septic tank and percolation area in the north of the Site.

Potable water used for office facilities, including faucets and toilet facilities, is obtained from a small onsite well in the northern section of the Site. The water used for site processes is obtained from the recycled water settlement system onsite, as described in Chapter 8 of this EIAR.

3.5.7 Landscape Screening

The boundary of the Site consists of a high bank with fencing and or hedging on top, separating the quarry from the local road network and neighbouring fields. The land use is largely agricultural and forestry to the north and south. The north quarry is partially visible from the R195 along the eastern boundary when approaching from the north and south.

Another quarry and processing plant is located at the western boundary of the quarry, run by BD Flood, which is 'substantially comprised of lands which were once part of the Flood family lands from which both quarries originated.

The northern, western and southern boundaries consist of hedging and field boundaries at the original ground level, with aggregate faces on the quarry side. The eastern boundary, which is adjacent to the R195, consists of fencing and a hedgerow. Quarry operations are visible on the road that goes through the northern section of the Site.

Further details on visual impact assessment are presented in Chapter 12 of this EIAR.

3.5.8 Safety and Security

Stockproof posts and wire fencing surround the site's perimeter. A warning sign has been erected on the access road to warn people about the potential health and safety risks associated with quarries. Gates are at the quarry's access point on the local L68185 road. The Site includes internal lighting and monitored security.

3.6 Utilities

The quarry has existing telecommunications, an ESB substation (MCC planning reference 98967) and an existing potable water supply that serves office facilities. Foul water for the office is collected and treated in a septic tank before it goes to a soakaway.

There is an ESB sub-station located in the northern section of the Site that provides mains electricity for site operations.

3.7 Receiving Waters

There are no receiving waters for the Proposed Development. There is a closed-loop water system onsite which consists of a series of pumped pipe networks and a settlement lagoon and canal system.

No water monitoring is carried out at the Site, and the Proposed Development does not require any form of water discharge licence.

There are several streams, rivers and lakes present within the vicinity of the Site. The Rathmea River flows ca. 560m north of the Site, and the Bane South Lough is the closest lake to the Site, ca. 360m north of the Site. The hydrological context of the Site is discussed in Chapter 8 below.

4 ALTERNATIVES CONSIDERED

4.1 Introduction

Schedule 6 of the Planning and Development Regulations, 2001 (S.I. No. 600 of 2001), as amended, requires an EIAR to contain:

> *"A description of the reasonable alternatives studied by the person or persons who prepared the EIAR, which are relevant to the Proposed Development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the Proposed Development on the environment."*

This Chapter assesses the alternative options considered by the Applicant when deciding to progress with the Development and outlines the following alternative considerations:

- Location;
- Layout; and,
- Design.

4.2 Alternative Location

The location of extractive industries is limited to where aggregates occur. As a finite resource, a proposed quarry or quarry extension must look at a range of environmental and commercial issues such as:

- The presence of the required aggregate;
- Contamination with other rock or soils;
- Its depth below the surface;
- Presence of groundwater;
- Access to necessary haulage routes;
- Proximity to markets; and,
- Historical unauthorised activities.

The Site comprised agricultural land that offered a suitable and appropriate location for the extraction of sand and gravel aggregate. As previously presented, this type of aggregate is of national importance. To maintain a future and in-demand aggregate supply, alternative site locations were not readily available. General infrastructure required for the Proposed Development is currently in place within the existing Quarry. The Proposed Development will utilise existing ancillary infrastructure; therefore, an alternative location was not considered appropriate.

4.3 Alternative Layout

Due to the nature of the EIAR, an alternative layout for the Site was not considered, as the current layout was developed through its design for efficient extraction, movement and production of material/aggregate within the Site and established water settlement canal system.

The established interconnection of various activities within the Site and the storage of raw and processed aggregate are key elements of the onsite layout. Although there are options to reorganise this layout, the environmental effects do not show clear long-term improvement over the existing layout.

Additionally, the environmental and financial costs of reorganising are higher than maintaining the status quo.

4.4 Alternative Design

4.4.1 Access

A review of the surrounding road network was undertaken as part of the assessment of alternative access points. The Quarry has a singular access point, off the L68185 local road, which connects to the R195 to the northeast of the Site. This access route is well established at the Proposed Development. As such, an alternative access was not given further consideration as a viable alternative.

4.4.2 Process

Limited processes are suitable for the extraction and screening of aggregate material. For developments of this scale, aggregate extraction can typically require the use of loading shovels and dump trucks.

Alternative variations, such as using variations to the plant onsite, i.e., different brands / sized machinery, are not seen as cost-effective. The existing plant has been in operation within the Site with no environmental issues recorded. It is well-maintained and has a documented service history. Therefore, no alternative processes are considered appropriate for the Proposed Development.

4.5 Complete Restoration

In 2019, a Warning Letter from MCC was sent to the Applicant under Section 152 of the Planning and Development Act 2000. In brief, this letter instructed the applicant to cease all extraction activities within the Site, agree to a restoration plan with MCC, and complete all restoration works within two years thereafter. Although a plan was progressed, further correspondence between the Applicant and the Council has enabled the current approach towards Substitute Consent to authorise the historic works. Substitute Consent is being sought in a separate remedial planning application, in accordance with all relevant legislation and guidance.

Under the development outlined in the Substitute Consent application, existing stockpiles would be cleared from the site, and the site would be restored.

A complete closure and restoration of the Site would put the viability of the operations within the quarry in doubt, placing local jobs at risk. The Site has a proven record as a supplier of nationally important resources of sand and gravel aggregates. The closure of the Site would remove aggregates from circulation, potentially exacerbating national supply issues. Additionally, the loss of this established quarry could lead to a greenfield site elsewhere being opened to extraction as an alternative source, leading to habitat loss and unknown effects.

4.6 Do Nothing Option

A ‘Do Nothing’ option, assuming the submitted substitute consent application is successful, will see stockpiles cleared from the Site and the Site undergoing restoration as submitted. Refer to section 4.5 above.

The ‘Do Nothing’ scenario means there is no potential for future land use at the Site.

The Site and associated development have facilitated the local area’s economy by directly employing ca. nine staff members. If the Site cannot be authorised for future works, the long-term future of the Site and associated jobs are at risk.

Additionally, the loss of this established quarry could lead to a greenfield site elsewhere in the region being opened to provide the needed quality aggregate products, leading to the potential for environmental effects elsewhere.

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FIGURES

TABLES

5 POPULATION AND HUMAN HEALTH

5.1 Introduction

This chapter of the EIAR provides a description and assessment of the likely impacts of the Proposed Development in terms of population and human health.

The local or receiving population comprises a significant element of the overall environment. In carrying out development, one of the principal concerns is that people should experience no diminution in their quality of life as a consequence of the Construction and Operational phases of development.

5.2 Methodology

A desk-based study was carried out to characterise the environment in relation to human beings, including the receiving population, population change over time, employment levels and human health.

This chapter has been prepared taking cognisance of the guidance set out in Chapter 1 and the following specific guidance documents:

- Institute of Public Health ('IPH'): Health Impact Assessment Guidelines 2021 [1];
- Institute of Environmental Management and Assessment ('IEMA') Health Impact Assessment in Planning, Impact Assessment Outlook Journal, Vol 8: October 2020 [2];
- IEMA: Health in Environmental Impact Assessment, A Primer for Proportionate Approach (2017) [3];
- IEMA: Effective Scoping of Human Health in Environmental Impact Assessment (2022) [4];
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- International Association for Impact Assessment ('IAIA') and European Public Health Association ('EPHA'): Human Health – Ensuring a High Level of Protection (2020) [6]; and,
- EPA: Guidelines on the Information to be contained in Environmental Impact Assessment Reports (2022) [7].

5.2.1 Health Sensitivity

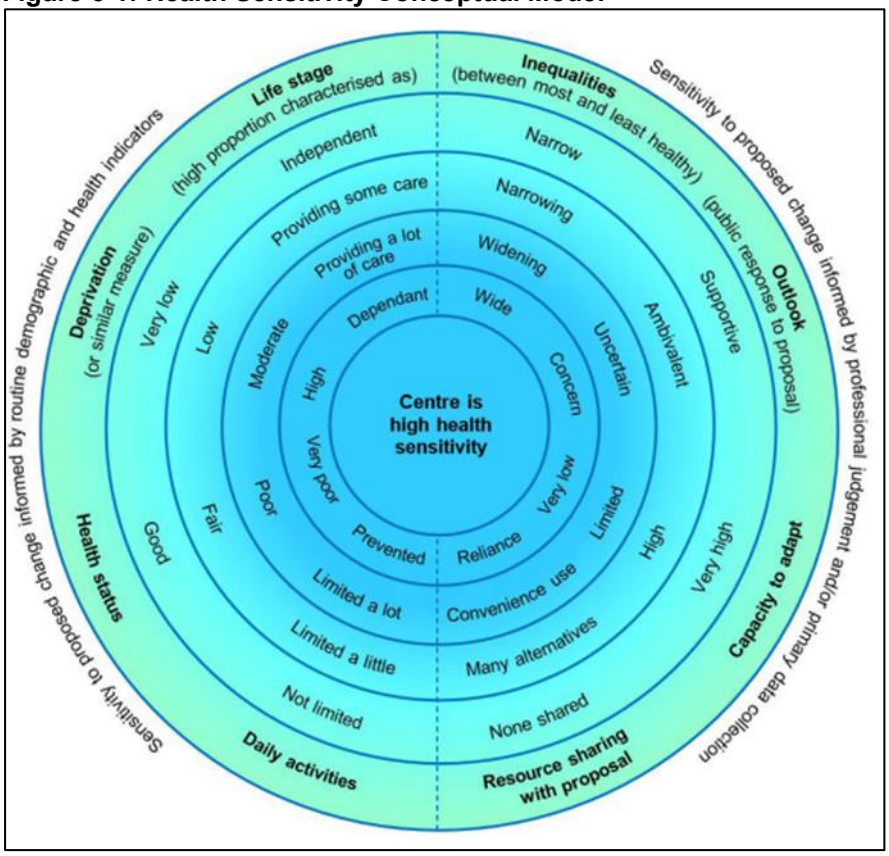
The IPH Guidance sets out (*Part 4 – Analysis: tools and resources*) a methodology for the determination of the health sensitivity of the local population. This methodology is summarised in Figure 5-1 below. The sensitivity of each factor was considered to determine the overall sensitivity of the local population in both the immediate area and the nearest population centre. The following sources were consulted in determining the sensitivity of the local population and the potential effects upon that population:

- Central Statistics Office ('CSO') Census Data for 2011, 2016 and 2022 [8];
- CSO Census Mapping Small Area Population Maps [9]; and,
- Pobal Deprivation Maps [10].

The results are set out below.

All subsequent chapters of the EIAR have addressed specific direct and indirect effects that have the potential to affect human health.

Figure 5-1: Health Sensitivity Conceptual Model



5.3 The Receiving Environment

The CSO provides data on population and certain socio-economic aspects of the population at different levels, including:

- Province;
- County;
- Local Electoral Areas ('LEAs');
- Electoral Division ('EDs');
- Towns / Settlements / Built-Up Areas ('BUAs'); and,
- Small Population Areas ('SAs').

SAs were created at the time of the 2011 Census to give greater clarity and context to population trends. As of the 2022 Census, BUAs have replaced Towns / Settlements. BUAs are made up of entire SAs.

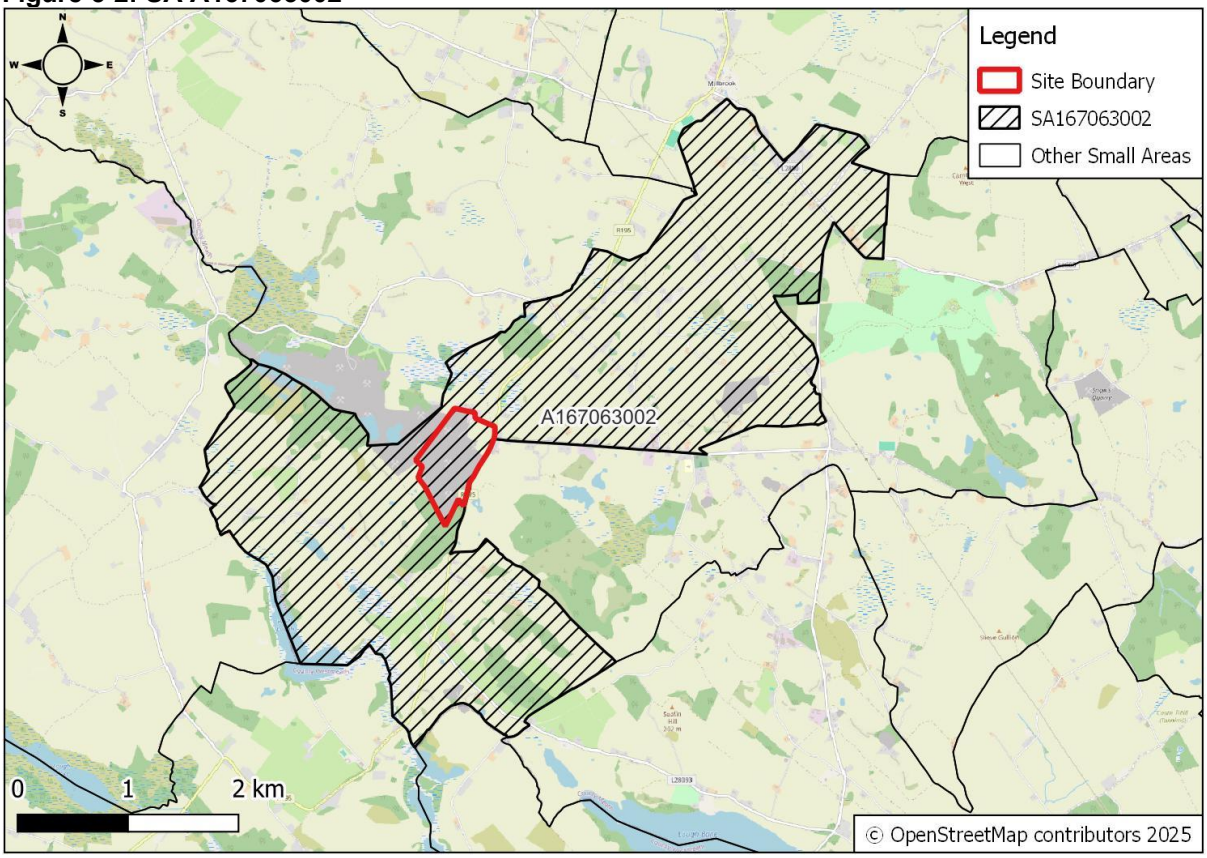
The borders of areas below County level may change from one Census to another, meaning direct comparisons between sets of Census data may not always be possible.

The Site lies within SA A167063002, the ED of Moylagh, and the LEA of Kells.

The CSO population figures from the 2022 Census Data are set out in Table 5-1 below. The corresponding figures for the ED, LEA, County and State are provided for context. Please note that there were changes to the SA, ED and LEA boundaries between the 2016 and 2022 Census. Therefore, the population change figures should be regarded as a guide rather than an absolute.

The Site is in County Meath, population 220,826. The population of Moylagh ED and Kells LEA are 423 and 34,575 respectively.

Figure 5-2: SA A167063002



5.3.1 Population

The CSO population statistics relevant to this EIAR are set out in Table 5-1 below.

5.3.2 Small Area Population Statistics

The 2011 census introduced the concept of 'Small Areas', which was established to give greater clarity and context to population trends. The small areas have been updated based on the 2022 census. Figure 5-2 above shows the site in the context of SA A167063002.

Various key statistics on the locality from the 2022 census are presented in Table 5-1 below. Please note that the 2021 Census was delayed until 2022 due to the COVID-19 pandemic.

Table 5-1: Population Statistics (2011-2022)

Area	Number of Persons			Change	
	2011	2016	2022	2011-2016	2016 - 2022
Small Area A167063002	228	205	210	-23	5
Moylagh ED	416	395	423	-21	28
Kells LEA*	28,608	32,398	34,575	3790	2177
County Meath	184,135	195,044	220,826	10909	25782

Area	Number of Persons			Change	
	2011	2016	2022	2011-2016	2016 - 2022
Ireland	4,588,252	4,761,865	5,149,139	174,613	387,274

*LEA area changed between 2011 and 2016.

5.3.3 Local Population

The nearest population centre to the Site is Oldcastle town. Table 5-2 below shows key statistics in relation to the population of SA A167063002 and Oldcastle town, taken from the CSO 2022 Census Mapping Small Area Population map [11]. County Meath and Ireland figures are given for comparison.

Table 5-2: Local Population Statistics for SA A167063002

Data Set	SA A167063002	Moylagh ED	County Meath	Ireland
Permanent Private Households	210	423	220,826	1,841,152
Unoccupied Buildings (%)	22%	17%	8%	13%
Total Population (Male%/Female%)	48.57%/51.43%	49.88%/50.12%	49.81%/50.19%	49.42%/50.58%
Age Breakdown (%)				
Aged 0 – 9	13.81%	13.24%	14.14%	12.39%
Aged 10 – 14	4.29%	4.26%	8.61%	7.27%
Aged 15 – 19	3.81%	4.26%	7.22%	6.56%
Aged 20 – 24	7.14%	5.20%	5.56%	5.96%
Aged 25 – 64	51.90%	52.96%	52.22%	52.74%
Aged 65 – 79	20.00%	16.55%	9.69%	11.56%
Aged 80+	3.81%	3.55%	2.56%	3.52%
Age Dependency Ratio*	59.09%	60.23%	53.85%	53.22%
% with Irish/UK Nationality	94.06%	92.05%	86.26%	84.52%
% identifying as White Irish	93.07%	92.05%	78.73%	75.61%
% identifying as Irish Traveller	0.00%	0.00%	0.45%	0.64%
% of 1 person households	32.53%	31.93%	17.31%	23.14%
% of Single-parent households	7.23%	6.02%	11.08%	11.38%
% Owner/occupiers	84.34%	82.42%	75.15%	65.77%
% Renting	7.23%	9.70%	19.60%	27.48%

Data Set	SA A167063002	Moylagh ED	County Meath	Ireland
Renting (Private Landlord)	4.82%	8.48%	12.51%	17.96%
(Local Authority/Housing Body)	2.41%	1.21%	7.09%	9.52%
% with Stated Central Heating	95.18%	96.36%	96.28%	93.85%
(Oil-Fired)	68.35%	71.70%	43.72%	38.79%
(Coal-Fired)	2.53%	2.52%	2.27%	3.45%
(Wood-Fired)	12.66%	7.55%	1.58%	1.73%
(Electric-Fired)	5.06%	5.03%	9.98%	11.74%
(Gas-Fired)	0.00%	0.00%	35.57%	32.66%
% with confirmed Water Supply	98.80%	98.18%	98.46%	97.72%
(Mains Water Supply)	30.49%	37.65%	76.53%	79.90%
(Private Water Supply)	63.41%	53.09%	20.32%	9.90%
(Group Water Supply)	4.88%	11.11%	4.44%	7.69%
% with Stated Sewerage	98.80%	98.18%	98.30%	94.95%
(Mains)	0.00%	0.00%	65.98%	63.30%
(Septic Tank)	87.80%	89.51%	27.81%	24.78%
% with a Disability (all ages)	16.67%	19.39%	19.56%	21.55%
% Caring for Disabled Person	5.24%	5.44%	5.39%	5.81%
% Working Age Unable to Work (Illness/Disability)	1.65%	3.72%	2.86%	4.58%
Health:				
Very Good / Good	89.52%	90.31%	86.71%	82.89%
Fair	7.62%	7.33%	7.56%	8.64%
Bad / Very Bad	0.00%	0.47%	1.44%	1.74%

*The age dependency radio is the number of dependents (aged 0-15 and 65+) per hundred people of working age (i.e. 15-64). A higher ratio indicates more pressure on the working population.

5.3.3.1 Pobal Information for SA167063002, Moylagh ED and County Meath

The census statistics have been used by Pobal on behalf of the Government of Ireland to develop deprivation indices to help inform planning and policy decisions [12]. Deprivation is categorised into eight bands, ranging from 'extremely affluent' to 'extremely deprived'.

The 2016 and 2022 census statistics have been used by Pobal on behalf of the Government of Ireland to develop deprivation indices to help inform planning and policy decisions. Table 5-3 below sets out the relevant factors, which together indicate that the SA for the local area

has a “Marginally Below Average” deprivation level, Moylagh ED has a “Marginally Below Average” deprivation level and Co. Meath has a “Marginally Above Average” deprivation level for 2022.

Table 5-3: Deprivation Indices for SA167063002, Moylagh ED and County Meath, 2022

Data Set	SA A167063002	Moylagh ED	County Meath
Pobal HP Index	-3.90	-1.13	1.56
Pobal HP Description	Marginally Below Average	Marginally Below Average	Marginally Above Average
Primary Education only (%)	17.50%	15.95%	9.30%
Third Level Education (%)	30.00%	34.22%	4.26%
Male Unemployment Rate	4.76	6.30	7.16
Female Unemployment Rate	11.63	6.90	7.76

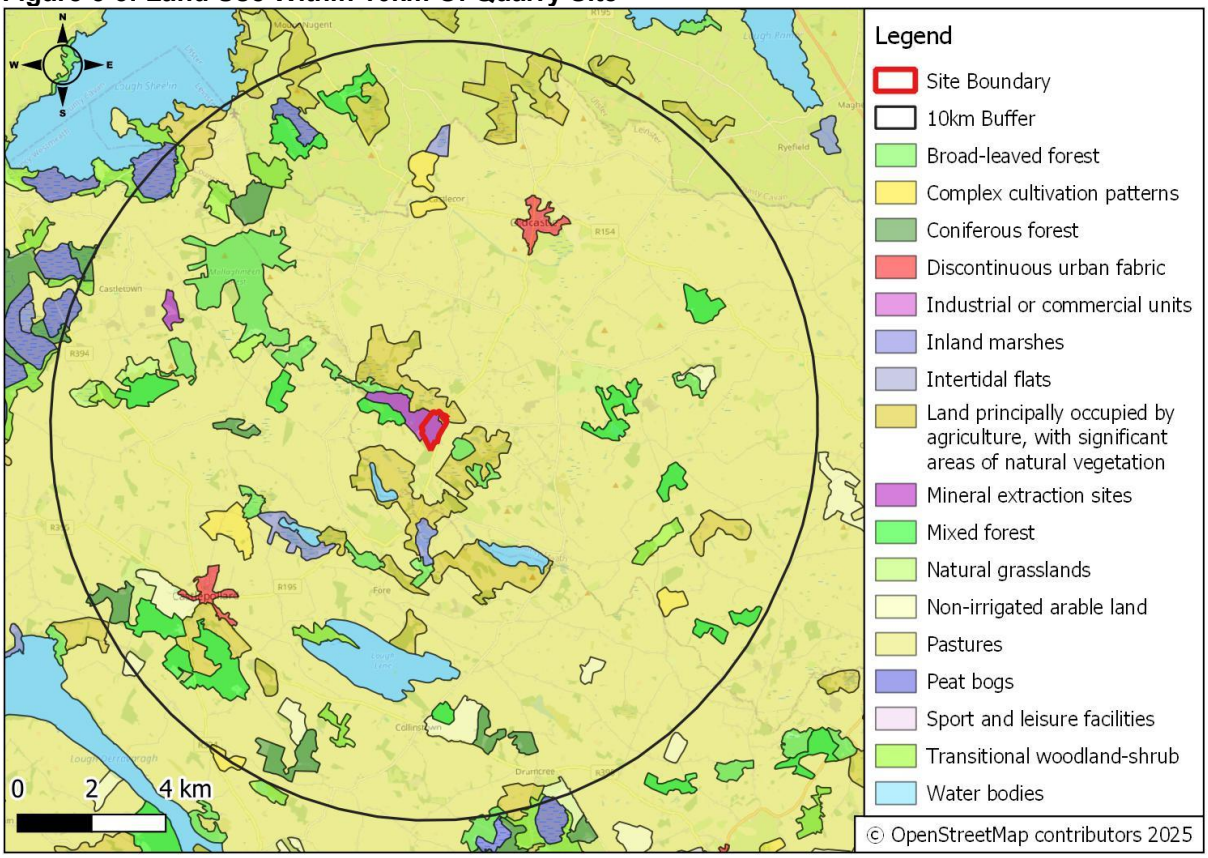
The 2022 national unemployment rate was 8.6% for males and 8.0% for females [8].

5.3.4 Surrounding Land Use

The surrounding land use is predominantly agricultural (pasture and crops), with expanses of broad-leaved / coniferous / mixed forest and small water bodies. There is a quarry adjacent to the western portion of the Site, owned by BD Flood. A precast concrete facility called Flood Precast is located ca. 3km northwest of the Site. There are also scattered individual dwellings, agricultural businesses, individual rural businesses, as well as industrial businesses.

There is a more urban land use closer to towns such as Oldcastle and Castlepollard. Figure 5-3 below illustrate land use in the vicinity of the Site, sourced from the EPA.

Figure 5-3: Land Use Within 10km Of Quarry Site

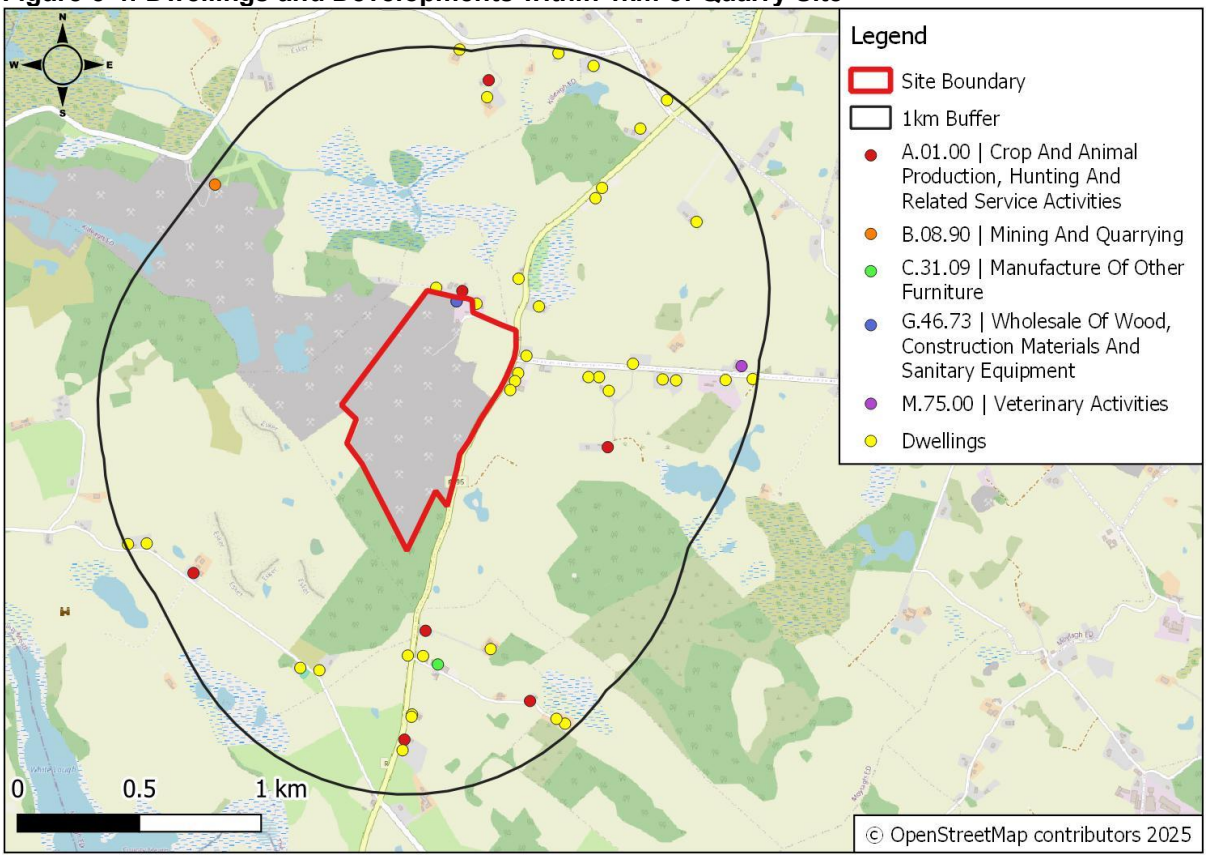


The nearest towns to the Site are:

- Oldcastle town (ca. 8km to the North);
- Castlepollard town (ca. 10km to the Southwest);
- Delvin village/town (ca. 11km to the West);
- Clonmellon (ca. 13.5km to the Southeast);
- Virginia town (ca. 15.2km to the Northeast);
- Ballyjamesduff village/town (ca. 16km to the North);
- Kilnaleck town (ca. 17.4km to the Northwest);
- Kells town (ca. 21km to the East);
- Athboy town (ca. 21.7km Southeast);
- Mullingar town (ca. 23km to the Southwest); and,
- Monaghan town (ca. 29km to the Northeast).

The closest settlement is the Oldcastle town. The town is ca. 8km to the north of the Site. Oldcastle has many industrial developments and businesses, schools, and recreational amenities such as Oldcastle GAA club. Figure 5-4 below shows residential dwellings and industrial developments within the immediate vicinity of the Site.

Figure 5-4: Dwellings and Developments within 1km of Quarry Site



5.3.5 Economic Activity and Employment

The economic activity / employment figures from the 2022 census for the immediate SA and Moylagh ED against the wider region are outlined in Table 5-4 below:

Table 5-4: Principal Economic Status of Working-Age Population

Area	In work	Student	Retired	Caring for home/family	Unemployed*	Unable to work (health)
SA A167063002	53.85%	7.14%	18.13%	14.84%	4.40%	1.65%
Moylagh ED	57.31%	6.88%	15.76%	12.32%	4.01%	3.72%
County Meath	59.32%	11.25%	13.15%	7.18%	4.76%	3.71%
Ireland	56.09%	11.10%	15.90%	6.58%	5.10%	4.58%

*Includes those looking for their first job

Table 5-5 below provides details on the occupations of those of working age (including the former occupation for those not currently employed).

Table 5-5: Occupations of Working-Age Population

Area	SA A167063002	Moylagh ED	County Meath	Ireland
Administrative/Secretarial Occupations	7.62%	8.45%	10.54%	9.20%
Associate Professional/Technical Occupations	11.43%	11.27%	12.25%	11.71%
Caring, Leisure, Service Occupations	6.67%	7.51%	7.36%	7.35%
Elementary Occupations	14.29%	9.86%	7.77%	8.15%
Manager/Director/Senior Officials	5.71%	9.39%	9.18%	7.72%
Process, Plant and Machine Operatives	17.14%	14.55%	7.61%	6.91%
Professional Occupations	10.48%	14.08%	18.36%	20.31%
Sales and Customer Service Occupations	2.86%	3.76%	6.01%	6.18%
Skilled Trade/Occupations	20.95%	19.25%	14.17%	12.57%
Not Stated	2.86%	1.88%	6.76%	9.90%

Of those of working age (15-64 years), the breakdown by occupation for SA167063002 and Moylagh ED is shown in Table 5-5 above against the overall figures for County Meath and Ireland. The high percentage of process / plant / machine operatives and skilled tradespersons, both in the local population and wider ED relative to the County and national figures, reflects the importance of the construction and extraction industries in the area.

Table 5-6 below shows the percentage of working adults working within various industries, according to the 2022 Census, both in the immediate area (the SAs) and the near vicinity of the Site (the EDs). The County and National figures are provided for context.

Table 5-6: Industry of Employment of Adults in Paid Employment (2022)

Area	SA A167063002	Moylagh ED	County Meath	Ireland
Agriculture, Forestry & Fisheries	10.20%	8.00%	3.56%	3.54%
Building and Construction	9.18%	8.50%	8.25%	5.80%
Manufacturing	24.49%	21.00%	11.28%	11.77%
Commerce/Trade	24.49%	26.00%	25.01%	23.82%
Transport/Communications	7.14%	6.00%	10.05%	9.15%
Public Administration	2.04%	2.50%	6.12%	5.67%
Professional Services	15.31%	19.50%	22.95%	24.48%
Other	7.14%	8.50%	12.78%	15.76%

5.3.5.1 Employment Opportunities in the Surrounding Area

Opportunities for employment exist within the vicinity of the Site in Oldcastle town (5.5km to the north), Castlepollard town (7.3km to the southwest), Kells town (21km to the east), and Virginia town (15.2km to the northeast), as well as in rural industries and smaller settlements around the area. One difficulty in accessing these employment opportunities is the low level of public transport across the area as a whole (although there are daily commuter bus services which links the nearby towns and smaller villages). This increases the relative importance of local employment in rural settings such as these.

According to the MCC CDP:

> *"Oldcastle is an important employment and service centre in north-west Meath with the highest jobs ratio in the County"*

5.3.5.2 Site Employment

The Proposed Development employs ca. 9 full-time persons at the Site.

5.3.6 Human Health

This section sets out the existing situation with regard to human health.

5.3.6.1 Sensitivity

The population of the immediate Small Area was considered in terms of the categories set out in Figure 5-1 above. The results of this consideration are set out in Table 5-7 below. The overall sensitivity of the population of the Small Area to any resulting impact is considered to be "Low".

Table 5-7: Consideration of Health Sensitivities in the Local Population (SA A167063002)

Criteria	Classification	Basis
SA A167063002		
Life Stage	Providing a lot of care	The age dependency ratio is above the national figure and the % of the population caring for someone with a disability is slightly below the national figure, representing an increase in the over-all care burden.
Deprivation	Limited a little	The Pobal HP Description is “marginally below average”.
Health Status	Good	The % of the population unable to work due to health/disability is below the national figure. The % of the population reporting ‘very good/good’ health is above the national figure and the % of the population reporting ‘bad/very bad’ health is below the national figure.
Daily Activities	Good	The % of the population caring for someone with a disability is below the national figure and the % of the population with a disability is below the national average.
Inequalities	Narrowing	The % of the population with education only to primary level is above the regional/county figure, and the % of the population with education to third-level and above is much higher than the regional figure. The male unemployment rate is well below the regional figure; however the female unemployment rate is higher. The rate of home ownership is well above the regional figure and the % of households renting from Local Authority or Housing Bodies is well below the regional figure.
Outlook Towards Proposal	Supportive/Ambivalent	The Quarry has existed for approximately 150 years. The Proposed Development will not increase the Quarry’s impact on the local environment.
Capacity of Health Services to adapt	Very High	The Proposed Development is not a health-related project and will have no impact on the local health infrastructure.
Resource Sharing with Proposal	None Shared	The Proposed will not have a large increase in power or water requirements, and these requirements do not represent an increase in current requirements.
Over-all Sensitivity Score	**Low**	

5.4 Characteristics and Potential Impact of Development

This section examines the potential effects on population and human health that may arise during all phases of the Proposed Development. This includes the potential for unplanned events and their possible outcome.

The potential effects that may arise if the Proposed Development does not take place are also examined.

5.4.1 Population

The development has enabled the Applicant to provide valuable local employment in a rural environment. The Proposed Development would enable this employment to continue into the foreseeable future.

5.4.2 Human Health

The potential effects on human health, particularly potential impacts on residents in the immediate locality of the Site, are addressed in detail in the following specialist chapters of this EIAR. The conclusions of these chapters are considered here in the context of the low health sensitivity determined in section 5.3.6.1 above. Refer to the specific chapters for further details and conclusions.

- Chapter 8: Water (Hydrology and Hydrogeology);
- Chapter 9: Air Quality;
- Chapter 10: Climate;
- Chapter 11: Noise and Vibration;
- Chapter 12: Landscape and Visual;
- Chapter 13: Cultural Heritage; and,
- Chapter 14: Material Assets – Traffic and Transport.

5.4.2.1 Safety

The Health and Safety Authority ('HSA') views the quarrying industry as a high-risk sector [13]. All safety measures outlined within the Safe Quarry - Guidelines to the Safety, Health and Welfare at Work (Quarry) Regulations 2008, [14] along with the guidelines outlined within the Safe Quarry A Guide for Quarry Workers, 2019 [15] will be followed.

Due to the nature of the Site and the work undertaken, there is a potential for workplace health and safety risks in relation to the extraction of material and the movement of onsite plant machinery. A site-specific health and safety plan will be in place during the Site preparation and the operational lifetime of the Proposed Development. Current Site security procedures will be continued to ensure the safety of the public.

The Applicant will also operate a strict health and safety management system for all works carried out for the Proposed Development.

The Safety and Health Commission for the Mining and other Extractive Industries (an EU Commission) produced *Guidance on the Safe Use of Explosives in Quarries (2001)* and this is the guidance document utilised by the HSA to determine safe working practices. Extraction activities associated with the Proposed Development have taken cognisance of this guidance document.

The Applicant has confirmed there have been no accidents or incidents associated with the Site.

5.4.2.2 Unplanned Events

As with all similar developments, there is some risk that accidents or disasters outside the operator's control could result in a risk to the environment and the local population. Such incidents could theoretically include fire, flood, explosions and oil / fuel spills arising from vehicle accidents.

Relevant potential unplanned events have been covered in the following chapters:

- Chapter 7: Land, Soils and Geology;
- Chapter 8: Water (Hydrogeology & Hydrology);
- Chapter 9: Air Quality; and,
- Chapter 11: Acoustics (Noise & Vibration).

5.5 Do-Nothing' Scenario

A 'Do-Nothing' Scenario would restrict the Applicant to their existing permission for the active sand and gravel pit, which is currently being processed at a reduced scale compared to historic production levels. Site works, which are currently inclusive of aggregates being sourced from extensive onsite stockpiles, would be restricted until the Site is brought into compliance and further authorised pending this planning application for prospective development.

A 'Do-Nothing' Scenario would result in a shorter lifespan for the quarry and, subsequently, a shorter employment period for the staff locally and regionally.

5.6 Proposed Mitigation Measures and/or Factors

Mitigation measures against the potential effects from the Proposed Development, which may impact on human health or the local population, are considered in detail within the following chapters:

- Chapter 3: Description of the Proposed Development;
- Chapter 7: Land, Soils and Geology; provides an assessment of potential likely and significant impacts (if any) on the geological and soil environment which have occurred, which are occurring, or which can reasonably be expected to occur, because of the Proposed Development;
- Chapter 8: Water; provides an assessment of the likely impact of the Proposed Development on the receiving hydrology (surface waters) and hydrogeology (groundwater) with measures to avoid any potential contamination of water will be in place;
- Chapter 9: Air Quality; provides an assessment of the potential impacts of the Proposed Development on air quality in the vicinity of the Site;
- Chapter 10: Climate Change; provides an assessment of the likely effects of the Proposed Development on climate change in the context of national greenhouse gas ('GHG') emissions and relevant sectoral targets. This chapter also assesses the potential effects of the Proposed Development from climate change;
- Chapter 11: Acoustics (Noise and Vibration); provides a description and assessment of the likely impact of the Proposed Development on noise and vibration;
- Chapter 12: Landscape and Visual; prepared by Macro Works and comprises a Landscape and Visual Impact Assessment ('LVIA') to review the existing landscape setting of the Site and to assess the likely potential landscape and visual impacts arising from the Proposed Development. It also describes any applicable proposed mitigation measures to reduce any likely adverse potential visual impacts on the receiving environment; and,

- Chapter 14: Material Assets – Traffic and Transport prepared by Roadplan. The findings of the transport assessment carried out for the Proposed Development. The existing transport features and surrounding road network is described, the likely impacts on the road network are assessed and mitigation measures are proposed where required.

5.7 Cumulative and In combination Effects

In combination with other businesses / enterprises in the area, the Site has contributed to sustaining the local economy and community. In combination with other extractive sites, the quarry also has a strong history of supporting the national supply of aggregates. The impact on the population in terms of employment and the local economy, and the impact on the aggregate supply, can be considered as long-term, positive and moderate.

The distance between the layout of the Site and the neighbouring BD Flood quarry negates the risk of cumulative and in-combination effects on human health arising from the extractive industry – see Chapters 9 (Air Quality) for a cumulative mineral dust risk assessment.

There is one EPA Industrial Emissions ('IE') licenced site within 5km of the Proposed Development. The potential for cumulative and in-combination effects between the Proposed Development and the IE licenced sites is not likely, primarily due to the distance between the majority of these licensed sites and the Proposed Development.

5.8 Interactions with other Environmental Attributes

Population and human health have the potential to be impacted positively or negatively by environmental issues. The relevant interactions with other key environmental factors are set out in section 5.4.2 above.

5.9 Indirect Effects

The Proposed Development has a positive indirect impact in regard to continued local employment.

The Proposed Development will continue to have a neutral-to-slight, positive, long-term effect regarding indirect local and regional employment such as:

- Operational staff;
- Machinery maintenance and facility upkeep; and,
- Health and safety specialists.

5.10 Residual Effects

The residual effect with regard to human health has been long-term and not significant to imperceptible.

The residual effect will be a positive long-term impact on the local economy and employment as well as the wider economy. The residual effect with regard to human health and safety will be not significant given all of the control measures that will be put in place, the low sensitivity of the local population and the lack of impact on health services.

5.11 Monitoring

Monitoring requirements are discussed within the individual chapters below.

5.12 Reinstatement

The Site will be subject to a Restoration Plan following the cessation of extraction onsite. Details of the Restoration Plan are included in Chapter 6 Biodiversity.

5.13 Difficulties Encountered in Compiling this Information

No difficulties were encountered.

REFERENCES

[1] Institute of Public Health in Ireland (IPH), "Health Impact Assessment Guidance: A Manual," IPHI, Dublin and Belfast, 2021.

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[3] IEMA, "Health in Environmental Impact Assessment A Primer for a Proportionate Approach," IEMA, 2017.

[4] IEMA, "Effective Scoping of Human Health in Environmental Impact Assessment," IEMA, London, 2022.

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[6] B. C. T. Cave, B. Fischer-Bonde, S. Humbolt-Dachroeden, P. Martin-Olmedo, O. Mekel, R. Pyper, F. Silva and F. &. X. Y. Viliani, "Human Health: Ensuring a high level of protection. A reference paper on addressing Human Health in Environmental Impact Assessment," International Association for Impact Assessment and European Public Health Association, 2020.

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[11] Central Statistics Office (CSO), "Census Mapping," 2022. [Online]. Available: https://visual.cso.ie/?body=entity/ima/cop/2016&boundary=C03736V04484. [Accessed February 2025].

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[13] Health and Safety Authority, "HSA Quarry Sector Resources," HSA, [Online]. Available: https://www.hsa.ie/eng/Your_Industry/Quarrying/Quarries_in_Ireland/HSA_Quarry_Sector_Resources/. [Accessed February 2025].

[14] Health and Safety Authority, "Safe Quarry, Guidelines to the Safety, Health and Welfare at Work, (Quarries) Regulations 2008," 2020.

[15 Health and Safety Authority, “Safe Quarry, A Guide for Quarry Workers,” 2019.
]

FIGURES

TABLES

PLATES

6 BIODIVERSITY

6.1 Introduction

This chapter of the EIAR has been prepared by the MOR Environmental team. This chapter provides a description and assessment of the potential, likely and significant impacts of the Proposed Development on ecology and biodiversity.

A detailed ecological appraisal has been carried out by a fully qualified and experienced MOR Environmental Ecologist in line with *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine* (2018 and revisions) [1]. This chapter details the methods and results of a desk study and field surveys undertaken to establish the baseline ecological status of the Site and its immediate surroundings and to assess the potential impacts of the Proposed Development.

In addition, an assessment on potential impacts on Natura 2000 sites was also undertaken and is presented in the Stage 1 Appropriate Assessment Screening Report ('AA') which forms part of the planning application. The AA should be read in conjunction with this chapter.

6.2 Study Assessment and Methodology

6.2.1 Relevant Guidance

The following standards and guidance documents were utilised to characterise the baseline conditions of the Site, the assessment of potential impacts to biodiversity and the appropriate mitigation measures required:

- Chartered Institute for Ecology and Environmental Management ('CIEEM'), *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine* (2018 and revisions) [1];
- National Road Authority ('NRA'), *'Guidelines for Assessment of Ecological Impacts of National Roads Schemes'* [2]*;*
- Wildlife, Habitats and the Extractive Industry: '*Guidelines for the Protection of Biodiversity within the Extractive Industry'* [3];
- *Fossitt's Guide to Habitats in Ireland* [4];
- Heritage Council's '*Best Practice Guidance for Habitat Survey & Mapping'* [5];
- NRA, '*Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes*,' [6];
- Froglife, '*Surveying for Amphibians*' [7];
- Junior Nature Conservation Committee ('JNCC'), '*Common Standards Monitoring Guidance* [8]*;*
- JNCC '*Herpetofauna Worker's Manual'* [9]*;*
- Scottish Badgers, '*Surveying for Badgers: Good Practice Guidelines,*' [10];
- The Mammal Society, '*Surveying Badgers,'* [11];
- Construction Industry Research and Information Association ('CIRIA'), C532 – Control of Water Pollution from Construction, Guidance for Consultants and Contractors [12];
- CIRIA, *C811- Environmental Good Practice on Site* (5th edition) [13];

- NRA *'Guidance for the Treatment of Badgers Prior to the Construction of National Road Schemes'* [14]: and,
- NRA*, 'Guidelines on the Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads* [15].

6.2.2 Desk Study

The desk study focused on identifying European designated sites within a 15km radius of the Site, nationally designated sites within a 5km radius of the Site and records of legally protected and notable species within 2km of the Site.

The area for which biological data were collected was based on an assessment of the ecological zone of influence of the Site (i.e. the area that could be affected by the scheme within which there is the potential for significant ecological effects).

The following literature sources were consulted in January 2025 as part of the desktop study:

- Review of aerial maps of the Site and surrounding area;
- The National Parks and Wildlife Service ('NPWS') website was consulted with regard to the most up-to-date details on conservation objectives for the Natura 2000 sites relevant to this assessment. [16];
- The Meath Council Planning Portal to obtain details about existing / proposed developments in the vicinity of the Site [17];
- The National Biodiversity Data Centre ('NBDC') website was consulted on the 20th January 2025 with regard to species distributions [18];
- The EPA Maps website was consulted to obtain details about watercourses in the vicinity of the Site [19]; and,
- BirdWatch Ireland – The Irish Wetland Bird Survey ('I-WeBS') data, which is coordinated by BirdWatch Ireland and under contract to the NPWS, was reviewed with regard to wintering waterbird population within the vicinity of the Site [20].

6.2.2.1 I-WeBS Data Request

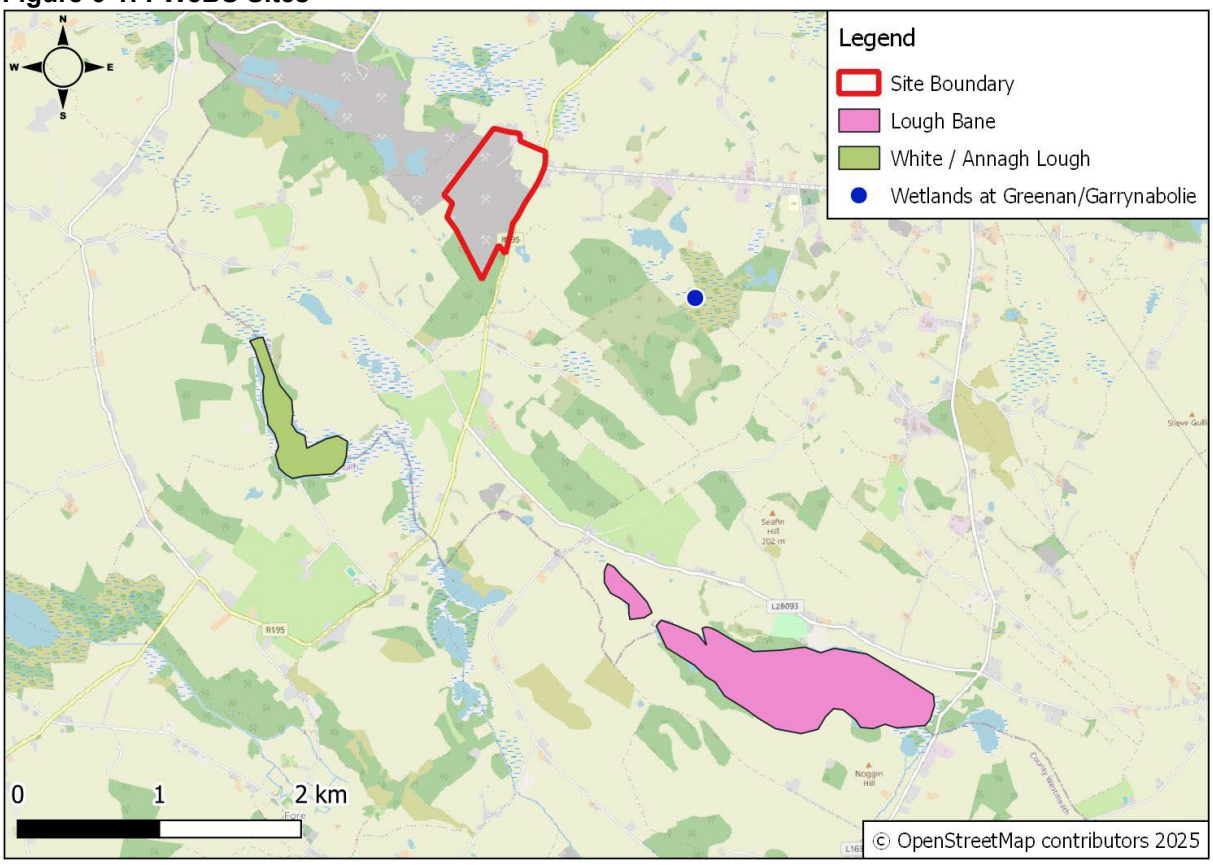
As mentioned above, I-WeBS data was reviewed in order to understand the potential assemblages of wintering bird populations that tend to occur within the vicinity of the Site.

As part of this review, a data request was submitted to the I-WeBS on 22nd January 2025. The data request was made for all available data from the nearest subsites to the east and west of the Site, as listed in Table 6-1 below. See Figure 6-1 for the location of the subsites in relation to the Site.

Table 6-1: I-WeBS Sites

Site Name	Site Code	Distance to the Site	Direction to the Site
Wetlands at Greenan/Garrynabolie	0V005	ca. 1.3km	E
White / Annagh Lough	0W01	ca. 1.7km	SW
Lough Bane	0V099	ca. 2.1km	SE

Figure 6-1: I-WeBS Sites



6.2.3 Field Survey

6.2.3.1 Habitat Survey

An initial habitat survey was undertaken on 16th January 2025 by two suitably qualified MOR Environmental Ecologists. A follow-up survey was undertaken on the 2nd May 2025. These surveys aimed to assess the extent and quality of habitats present on the Site and to identify any potential ecological receptors. All the surveys were undertaken using the Fossitt's Guide to Habitats in Ireland [4] and were conducted in line with the Heritage Council's '*Best Practice Guidance for Habitat Survey & Mapping'* [5].

The assessment was extended to also identify the potential for these habitats to support other features of nature conservation importance, such as species afforded legal protection under either Irish or European legislation. Based on the habitats present, additional species-specific surveys were also undertaken for the following species: amphibians, badger, peregrine falcon and sand martin. Please see further details below.

6.2.3.2 Protected / Notable Species

The methodologies used to establish the presence / potential presence of faunal species are summarised below. These relate to those species / biological taxa that the desk study and habitat types present indicated could occur on the Site.

<u>Flora</u>

The Site was assessed for the presence of notable / protected flora species in accordance with the following:

- Flora (Protection) Order 2022 (S.I. No. 235/2022); and,

- Ireland Red List No. 10: Vascular Plants [21].

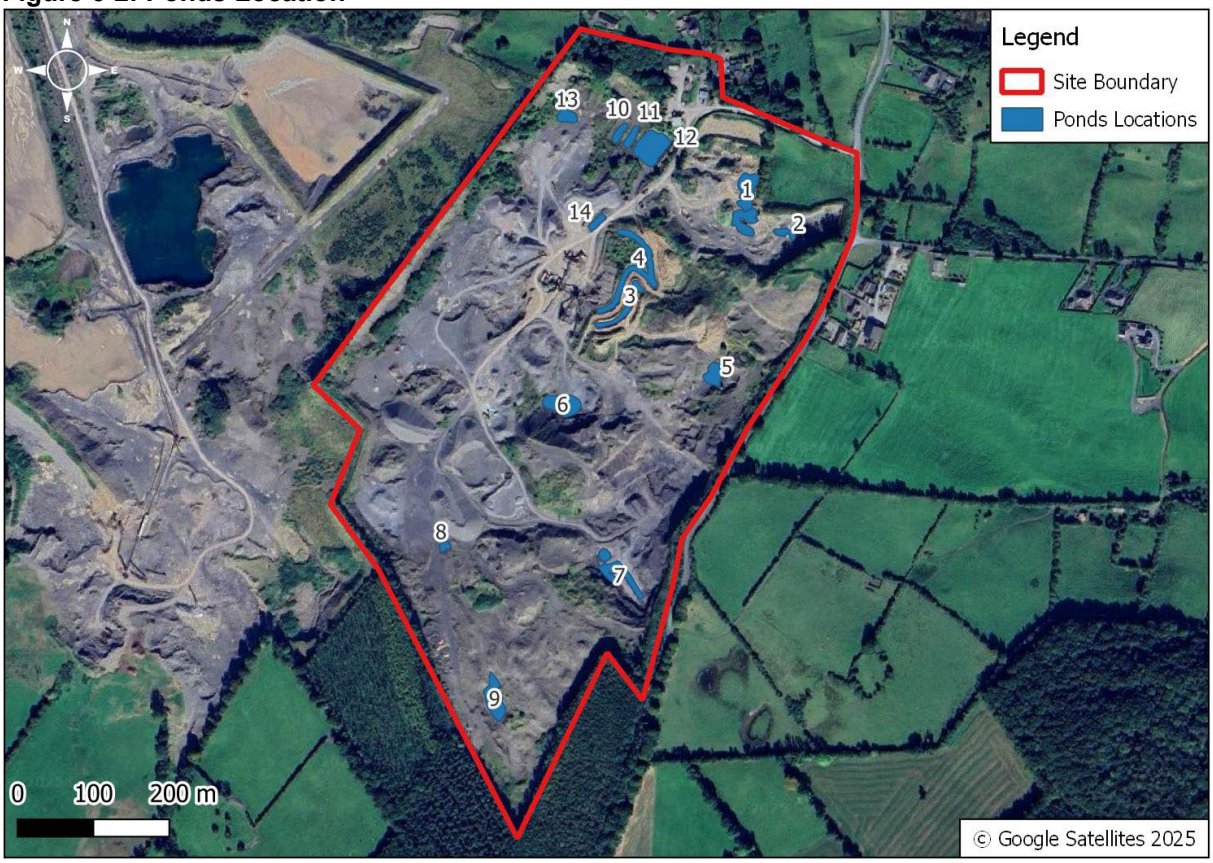
Amphibians

The Site was assessed for its potential to provide sheltering, foraging and breeding habitat for amphibians. These include static or slow-moving waterbodies suitable for egg-laying, and terrestrial habitats comprising open areas with mixed-height vegetation, such as heathland, rough grassland, open scrub or water body margins. Suitable well drained and frost-free areas are needed to enable amphibians to survive the winter.

The initial field survey on 16th January identified the presence of suitable terrestrial habitat, with 14 waterbodies recorded within the Site that had the potential to support amphibians.

Targeted amphibian surveys were undertaken on the 20th March, 31st March, 7th April and 24th April 2025. See Figure 6-2 below for the location of the ponds identified onsite.

Figure 6-2: Ponds Location



The site assessment and targeted surveys were conducted in line with the following relevant guidance for amphibian:

- NRA, now TII, '*Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes*,' [6];
- JNCC, '*Common Standards Monitoring Guidance*,' ; and,
- JNCC '*Herpetofauna Worker's Manual*' .

The following criteria were used to establish the presence / potential presence of faunal species, which are summarised below:

Habitat Suitability Index

The Habitat Suitability Index ('HIS') establishes the suitability of a water body to support the great crested newt and was developed. The HSI incorporates ten suitability indices, all of which are factors known to affect this species, such as pond location, size of pond, years when pond dries out, water quality, suitability of terrestrial habitat, connectivity to other ponds and presence of waterfowl and fish.

Presence / Absence Survey

- Refugia Search:

  This will take place in daylight. A refugia search is carried out on the terrestrial area near the pond being surveyed. This includes searching amongst old debris, logs, under rocks and through vegetated areas.

- Egg Search:

  This is conducted before dusk. Systematic search through submerged vegetation for egg wraps. The inspection takes place in daylight hours. If a smooth newt egg wrap is found, the search ends to avoid further disturbance.

- Netting:

  This is conducted during daylight. Surveyors, using a long-handled dip net walk the perimeter of the water body (where accessible). If a newt is caught, netting is ceased immediately due to the disruptive nature of netting.

- Torching:

  This is conducted after dusk as newts are most active. Torching is used to determine presence or absence of newts and to estimate the population. A high-powered torch (1 million candle power) is used around the margins of the waterbody to detect newt activity.

Full details of the survey methodology are provided in Appendix 6-1: Amphibians Report.

Badger

The survey aimed to identify and examine areas where badgers (Meles meles) might occur by noting any evidence of badger activity. This included:

- Mammal paths;
- Badger hairs caught in sett entrances / fences / vegetation;
- Paw prints;
- Evidence of foraging (usually in the form of 'snuffle holes');
- Badger Scat (isolated badger droppings);
- Latrines (shallow pits/holes occurring together comprised of exposed badger droppings); and,
- Badger setts.

A mammal path was assumed to be used by badgers if the character of the path (in terms of size) was appropriate and / or if any other signs were in close vicinity (e.g., a badger sett).

The field survey of the Site was conducted in line with the following relevant guidance for badger:

- Scottish Badgers, '*Surveying for Badgers: Good Practice Guidelines,*' [10];
- The Mammal Society, 'Surveying Badgers,' [11]; and,
- NRA, now Transport Infrastructure Ireland ('TII'), '*Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes*,' [6].

Bats

An initial assessment was carried out during the habitat survey for suitability of the habitats within the Site to provide bat roosting, foraging and flight path habitats. Bat habitats and commuting routes identified were considered in relation to the wider landscape to determine connectivity for local bat populations, and through the examination of aerial mapping.

Assessment criteria for evaluating the potential suitability of the Site for bats were carried out in line with 'Bat Surveys for professional Ecologists: Good Practice Guidelines' [22].

The following criteria were used to assess the mature trees onsite:

- Presence of natural cavities, splits, cracks, loose bark and rot holes in the trunk or boughs of the tree;
- Presence of dense and woody ivy (Hedera helix) growth that could be used by bats for roosting;
- Evidence of bat droppings, which may also be seen as a black streak beneath holes, cracks, branches, etc;
- Presence of smooth edges with dark marks and urine stains at potential entrances to roosts;
- Adjoining habitat which are likely to be important to bats, including the river corridor and hedge / treelines within the survey area that offer a variety of potential foraging, roosting and commuting opportunities for bats; and,
- Adjoining potential roosts / known roosts identified. This raises the likelihood of a tree being of benefit, as bats may move roosts if the roost becomes too hot or cold during roosting, and a nearby alternative roost is highly desirable.

Assessment criteria were used for evaluating the potential suitability of the Site for bats in line with *'Bat Surveys for Professional Ecologists: Good Practice Guidelines'* [23].

Table 6-2: Guidelines for assessing the potential suitability of proposed development sites for bats, based on the presence of habitat features within the landscape, to be applied using professional judgement [23].

Potential Suitability	Description of Roosting habitats in structures	Description of Potential flight-paths and foraging habitats
None	No habitat features on site likely to be used by any roosting bats at any time of the year (i.e. a complete absence of crevice/suitable shelter at all ground/underground levels).	No habitat features on site likely to be used by any commuting or foraging bats at any time of the year (i.e. no habitats that provide continuous lines of shade / protection for flight-lines, or generate / shelter insect populations available to foraging bats).

Potential Suitability	Description of Roosting habitats in structures	Description of Potential flight-paths and foraging habitats
Negligible[1]	No obvious habitat features on site likely to be used by roosting bats; however, a small element of uncertainty remains as bats can use small and apparently unsuitable features on occasion.	No obvious habitat features on site likely to be used as flight-paths or by foraging bats; however, a small element of uncertainty remains in order to account for non-standard bat behaviour.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically at any time of the year. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions[2] and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e., unlikely to be suitable for maternity and not a classic cool / stable hibernation site, but could be used by individual site, but could be used by individual hibernating bats[3]).	Habitat that could be used by small numbers of bats as flight-paths such as a gappy hedgerow or unvegetated stream, but isolated, i.e., not very well connected to the surrounding landscape by another habitat. Suitable, but isolated habitat that could be used by small numbers of foraging bats, such as a lone tree (not in a parkland situation) or a patch of scrub.
Moderate	A structure with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only, such as maternity and hibernation – the categorisation described in this table is made irrespective of species conservation status, which is established after presence is confirmed).	Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by bats for flight-paths such as river valleys, streams, hedgerows, lines of trees and woodland edge. High-quality habitat that is well connected to the wider landscape, that is likely to be used regularly by foraging bats, such as broadleaved woodland, tree-lined watercourses and grazed parkland. Site is close to and connected to known roosts.
High	A structure with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat. These structures have the potential to support high conservation status roost, e.g. maternity or classic cool / stable hibernation site.	Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats, such as river valleys, streams, hedgerows, lines of trees and woodland edge. High-quality habitat that is well connected to the wider landscape, that is likely to be used regularly by foraging bats, such as broadleaved woodland, tree-lined watercourses and grazed parkland. Site is close to and connected to known roosts.

Birds

The Site was assessed for its potential to support important assemblages of birds of rare or notable species, as well as designated bird species. The survey aimed to identify and examine

[1] Negligible is defined as 'so small or unimportant as to be not worth considering, insignificant'. This category may be used where there are places that a bat could roost or forage (due to one attribute) but it is unlikely that they actually would (due to another attribute).

[2] For example, in terms of temperature, humidity, height above ground level, light levels or levels of disturbance.

[3] Evidence from the Netherlands shows mass swarming events of common pipistrelle bats in the autumn followed by mass hibernation in a diverse range of building types in urban environments (Korsten *et al.,* 2016 and Jansen *et al.,* 2022). Common pipistrelle swarming has been observed in the UK (Bell, 2022 and Tomlinson, 2020) and winter hibernation of numbers of this species has been detected at Seaton Delaval Hall in Northumberland (National Trust, 2018). This phenomenon requires some research in the UK, but ecologists should be aware of the potential for larger numbers of this species to be present during the autumn and winter in prominent buildings in the landscape, urban or otherwise.

the suitability of the Site for potential wintering and breeding birds. Any bird activity onsite and potential nesting habitats were noted.

Following the identification of breeding bird habitats within the greenfield lands onsite, it was deemed necessary to undertake targeted surveys for breeding birds in 2025.

Transect breeding bird surveys were undertaken on 19th March, 9th April and 2nd May 2025. The breeding bird surveys were conducted in line with the methodology described in:

- British Trust of Ornithology ('BTO') - *A Field Guide to Monitoring Nests* [24]; and,
- Common Bird Census in *Bird Monitoring Methods* [25].

Transects were walked along the perimeter of the quarry and around the stockpiles by a suitably qualified and experienced MOR Environmental Ecologist. The transect route is presented in Figure 6-3 below.

All birds were recorded through sight and sound. Optical equipment was used, including binoculars, to minimise disturbance to potentially breeding birds. The hedgerow / treeline onsite were examined for the presence of nests. During the survey, the behavioural activity of the recorded birds was noted using the BTO breeding status codes [26]. Birds that displayed non-territorial behaviours were also recorded (i.e. birds that were flying over the transect area, birds that were foraging and not calling, birds that were loafing).

Therefore, birds were classified as non-breeding, possibly breeding and confirmed breeding based on the behaviours exhibited. The criterion for each classification is described below:

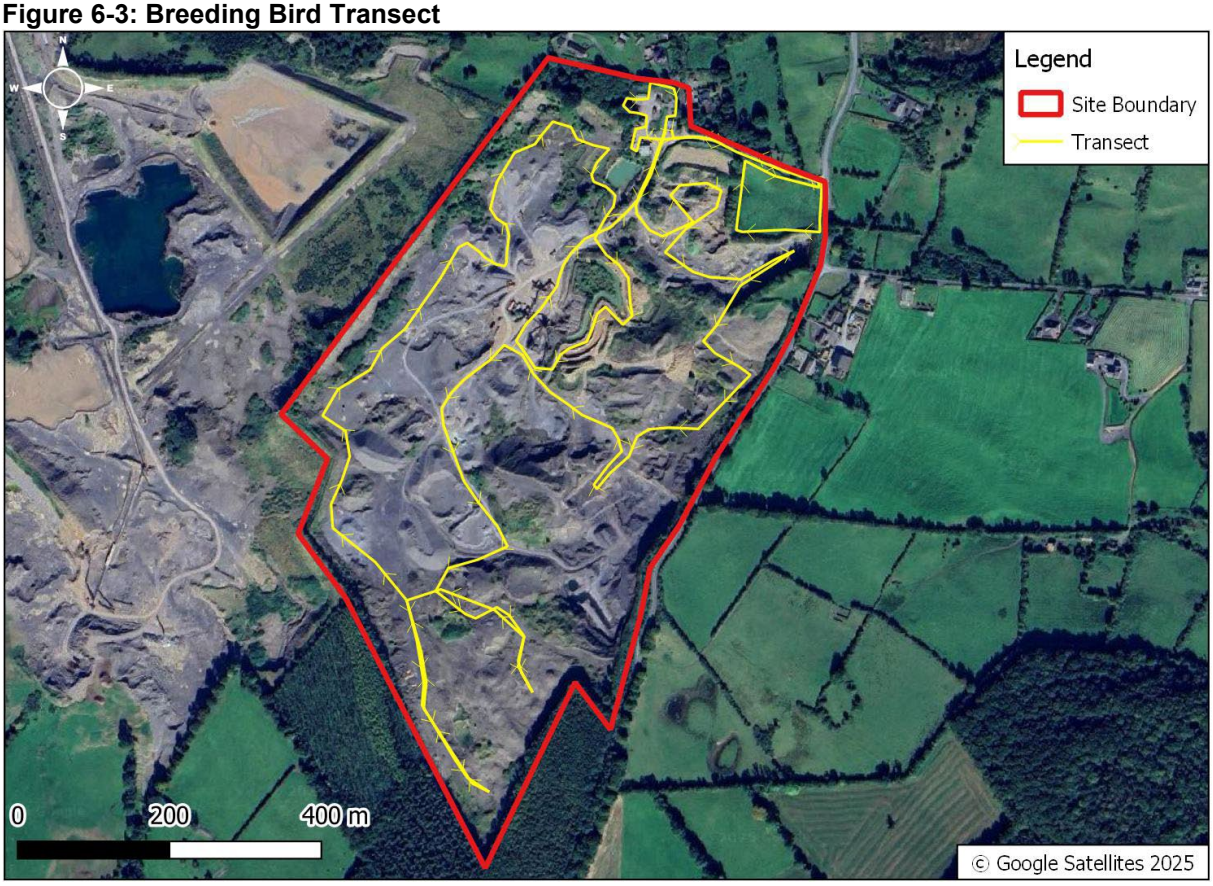
- Non-breeding – Birds that were flying over the transect area, birds that were foraging and not calling, birds that were loafing;
- Possible Breeding – Birds observed in suitable nesting habitat and displaying either territorial and / or courtship behaviours, nest building behaviours or observed visiting a possible nest; and,
- Confirmed Breeding – Birds observed either on nest or carrying faecal sac or food, sighting of a nest with eggs / chicks, used nests, eggshells or recently fledged young.

The survey dates, times and weather conditions for the three transect surveys are described in Table 6-3.

Table 6-3: Metadata for Breeding Birds Surveys

Date	Survey Times (Start-End)	Temperature (°C) (Start – End)	Wind (Beaufort Wind Scale)	Rain	Cloud Cover
19/03/2025	08.30 – 10:00	3 - 8°C	2	No Rain	0-33%
09/04/2025	07.25 – 08.25	10 -11°C	2	No Rain	0-33%
02/02/2025	07:40-09.30	7 - 12°C	2	No Rain	0-33%

Figure 6-3: Breeding Bird Transect



Peregrine Falcon

Combined peregrine falcon (*Falco peregrinus*) and sand martin (*Riparia riparia*) surveys were conducted by a suitably qualified and experienced MOR Environmental Ecologist on the 19th March, 9th April and 2nd May 2025.

These surveys aimed to establish whether any nest sites were located within close proximity to the Site, and ensure appropriate remedial mitigation is included as required.

The peregrine falcon surveys were conducted over a three-hour period and utilised a designated Vantage Point ('VP'), which provided appropriate views of the quarry wall that was noted as having a potential nesting habitat for the peregrine falcon (see Figure 6-4). The VP was selected to ensure that no potential disturbance to these species, should they be present, occurred during the survey works. After the vantage point survey, a walkover of the Site was undertaken to confirm the presence or absence of sand martin nest holes.

The peregrine falcon was conducted in line with the guidelines described in *Raptors: A Field Guide for Surveys and Monitoring* [27].

Survey dates, times and weather conditions are described in Table 6-4.

The breeding status of peregrine falcon was characterised using the following criteria:

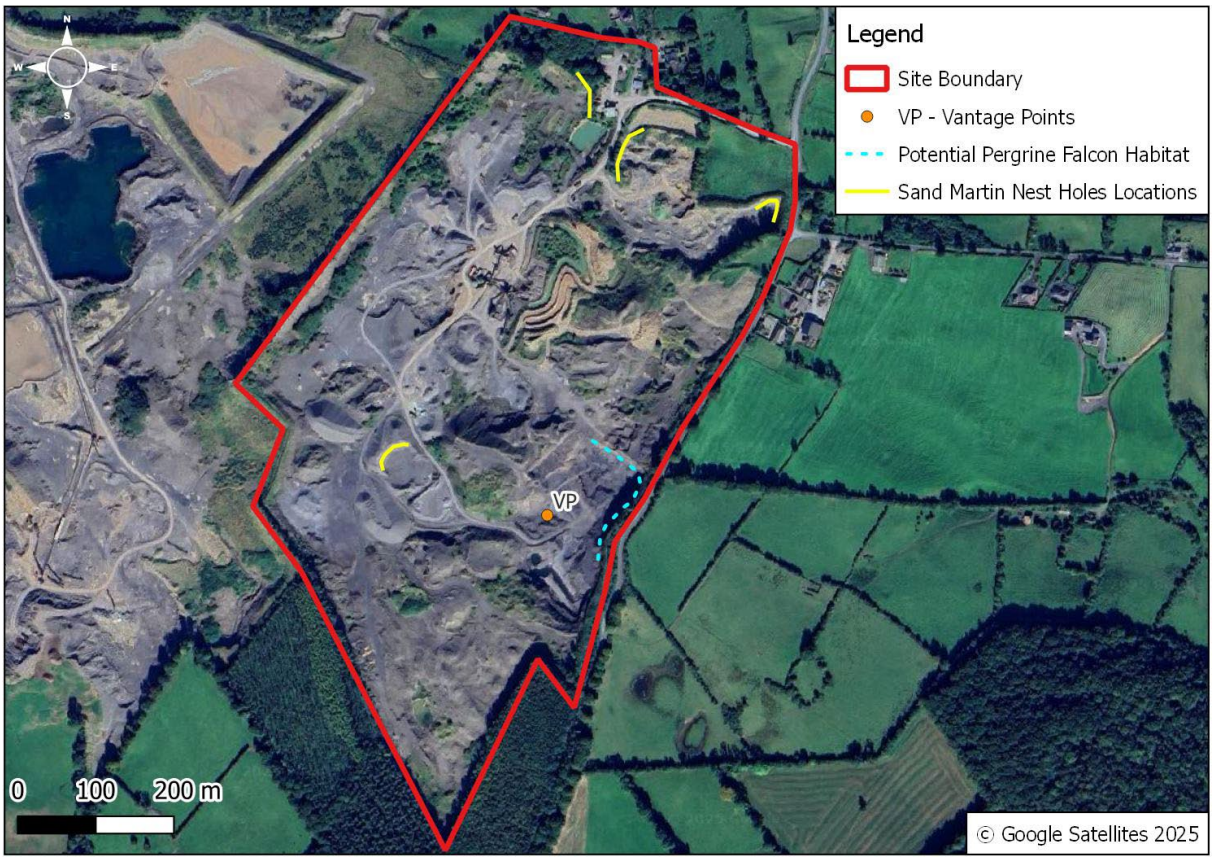
- Non-breeding – peregrine that were foraging, flying over the survey area or loafing;
- Possible breeding – peregrine falcon that were observed in suitable nesting habitats and displaying either territorial and / or courtship behaviours, nest building behaviours or observed visiting a possible nest; and,

- Confirmed breeding – peregrine observed either on / in a nest, carrying a faecal sac / food and /or sighting of a nest with eggs / chicks, used nests, eggshells or recently fledged young.

Table 6-4: Peregrine Falcon and Sand Martin Survey Metadata.

Date	Survey Times (Start – End)	Temperature (°C) (Start – End)	Wind (Beaufort Wind Scale)	Rain	Cloud Cover
19/03/2025	10:00-13:00	8-11°C	3	None	Clear
09/04/2025	10:00-13:00	12-16°C	1-2	None	Clear
02/05/2025	10:00 – 13:00	13-15°C	1-2	None	Clear

Figure 6-4: Vantage Point used for the Peregrine Falcon Survey and Sand Martin Nest Holes locations



Sand Martin

As part of the peregrine falcon survey conducted onsite, sand martin activity within the Site was also recorded. The survey aimed to determine whether sand martins use the site for breeding and to assess any potential impacts from onsite activities. A walkover of the Site was conducted to confirm the presence or absence of sand martin nest holes.

Invasive Species

The Site was visually assessed for the presence of any noxious / invasive species that are regulated under the European Union (Invasive Alien Species) Regulations 2024 (S.I. No. 374/2024) [28] such as Japanese knotweed (*Reynoutria japonica*) and Himalayan balsam (*Impatiens glandulifera*).

The Site was also assessed for the presence of non-regulated invasive species that have the potential to impact local biodiversity.

Other Species

In addition, an assessment was carried out of the potential for the Site to support any other species considered to be of value for biodiversity, including those that were identified as occurring locally based on the findings of the desktop study and professional judgment.

Camera Trap Surveys

Two camera traps were set up following the identification of a potential outlier badger sett. The camera traps were set up from 24th April to 2nd May 2025.

The camera traps were a Browning Strike Force HD Pro X Trail Camera and a Browning Strike Force Full HD 1080p camera, and were programmed to record a video following motion detection. The aim of the camera trap survey was to identify what species, if any, were using the large mammal holes on the Site and may be impacted by the Proposed Development.

6.2.3.3 Survey Limitations

No survey limitations were encountered.

6.2.4 Assessment Methodology

The starting point for the assessment was to undertake a scoping exercise for those ecological receptors that would require further consideration as part of the assessment. This involved differentiating the biodiversity receptors (i.e., designated sites, habitats, and species populations) that could be significantly affected by the Proposed Development.

The approach that was used for determining which receptors have the potential to be significantly affected by the Proposed Development involved using baseline data collected through the desk study and field surveys for the Site. Based on professional judgement, data from the following radii was collected: 2km away for protected species, 15km for Natura 2000 sites and 5km away from Natural Heritage Areas. The desk and field-based data was used to determine:

- Which, if any, of the species or habitat that have been recorded are legally protected or controlled (see Box 1); and,
- Which, if any, sites, areas of habitat and species that have been recorded are of importance for biodiversity conservation.

The next stage of the assessment was to determine whether the identified receptors are of sufficient biodiversity value that an impact upon them would be of potential significance in terms of this EIAR. In this regard:

- Biodiversity conservation value relates to the quality and / or size of sites or habitats, or the size of species' populations; and,
- Potential significance means that the effect could be of sufficient concern or, for positive effects, of such substantial benefit that it could be material to influencing the decision on planning.

Receptors that have been identified as having sufficient value, and that an impact upon them could be of potential significance, have been taken forward for further consideration. Legally protected species were also considered further (refer to Box 1 below). This involved:

- Identifying, for each receptor, any significant impact that is likely to be caused by the Proposed Development, which has the potential to lead to a significant effect and / or to contravene relevant legislation;

- Determining the area within which the likely impacts would cause a potentially significant impact on the identified receptor and / or could contravene relevant legislation (ecological zone of influence); and,
- If the receptor occurs or is likely to occur within the zone of influence and concluding that the receptor could be significantly affected and / or the relevant legislation contravened, the receptor would be subject to further assessment.

6.2.5 Evaluation of the Conservation Importance of the Site

In terms of biodiversity conservation, the Site was evaluated using the ecological evaluation guidance given in the TII, formerly known as the NRA, guidance on assessment of ecological impacts of National Road Schemes International importance [2], using the following scale:

- International importance;
- National importance;
- County importance (or vice-county in the case of plant or insect species);
- Local importance (higher value); and,
- Local importance (lower value).

6.3 Planning Context

6.3.1 Legislation / Policy Context

Within Ireland, a number of sites of international or national importance to nature conservation, as well as many species of animal and plants are afforded some degree of legal protection, for details see Box 1 below.

Box 1 Designated Wildlife Sites and Protected and Otherwise Notable Habitats and Species

The National Park and Wildlife Service ('NPWS') notifies sites in Ireland that are of international or national importance for nature conservation (although some sites that are of national importance for certain species have not been so designated).

Internationally important sites may also be designated as:

- Special Areas of Conservation ('SACs') and Candidate Special Area of Conservation ('cSACs'): the legal requirements relating to the designation and management of SACs in Ireland are set out in the European Communities (Birds and Natural Habitats) Regulations 2011-2021 (S.I. No. 477/2011);
- Special Protection Areas ('SPAs') and candidate Special Protected Areas ('cSPAs'): strictly protected sites classified in accordance with Article 4 of the EC Directive on the Conservation of Wild Birds (2009/147/EC), also known as the Birds Directive; and,
- Ramsar sites: wetlands of international importance designated under the Ramsar Convention, to which Ireland is a signatory.

Other statutory site designations relating to nature conservation are:

- National Heritage Areas ('NHA'): these represent examples of some of the most important natural and semi-natural terrestrial and coastal habitats in the country and are afforded protection under the Wildlife (Amendment) Act 2000. NHAs are legally protected from damage and receive protection from the date they are formally proposed for designation; and,
- Proposed Natural Heritage Areas ('pNHAs'): these sites are not afforded the same protection as NHAs. These sites are proposed by the NPWS but are not statutorily proposed or designated. Prior to statutory designation, these are subject to a very limited legal protection. They are, however, sites of significance for wildlife and habitats and are important for the purposes of this Biodiversity Chapter.

Legally protected species

Many species of animal and plant receive some degree of legal protection. For the purposes of this study, legal protection refers to:

- Species included in the Wildlife (Amendment) Act 2000, excluding species that are only protected in relation to their sale, reflecting the fact that the site disposal will not include any proposals relating to the sale of species; and,
- Species afforded protection under the Flora (Protection) Order 2022 (S.I.No.235/2022).

Other notable habitat/species categories

- Biodiversity Action Plan ('BAP') species: those targeted in local or national BAPs as being of particular conservation concern (priority species).
- Red and Amber List birds: those listed as being of high or medium conservation concern as listed by Birdwatch Ireland on the Birds of Conservation Concern in Ireland 2020-2026 [29].
- Other Irish Red Data Book species [30] and Nationally/Regionally/Locally Notable species, where appropriate.

6.3.2 National Planning Context

A study of biodiversity related planning policy at the national and local level has been undertaken for the Site and locality to highlight any potential conflicts with the relevant legislation and guidance documents as outlined in Box 1.

6.3.2.1 Project Ireland 2040 National Planning Framework

Project Ireland 2040 was launched by the Government in February 2018 [31] and incorporates two policy documents - the National Planning Framework and the National Development Plan.

The National Planning Framework First Revision – April 2025

Following a decision of the Government in June 2023, the preparation of a revised NPF [32] commenced to take account of changes that have occurred since it was published in 2018 and to build on the existing framework.

The National Planning Framework First Revision was approved on 30th April 2025 by both Houses of the Oireachtas. Objectives under the 'Strategic Planning for Biodiversity' section of this revised framework, include the following:

National Policy Objective 84:

> *'In line with the National Biodiversity Action Plan and European Union Nature Restoration Law, and best available scientific information, regional and local planning authorities shall support the preparation and implementation of the National Restoration Plan.'*

National Policy Objective 85:

> *'In line with the National Biodiversity Action Plan; the conservation, enhancement, mitigation and restoration of biodiversity is to be supported by:*
>
> - *Integrating policies and objectives for the protection and restoration of biodiversity, including the principles of the mitigation hierarchy of - avoid, minimise, restore and offset - of potential biodiversity impacts, in statutory land-use plan.*
> - *Retention of existing habitats which are currently important for maintaining biodiversity (at local/regional/national/international levels), in the first instance, is preferable to replacement/restoration of habitats, in the interests of ensuring continuity of habitat provision and reduction of associated risks and costs.'*

National Policy Objective 86:

> *'In line with the objectives of the National Biodiversity Action Plan, planning authorities should seek to address no net loss of biodiversity within their plan making functions.'*

National Policy Objective 87:

> *'Enhance the conservation status and improve the management of protected areas and protected species by:*
>
> - *Implementing relevant EU Directives to protect Ireland's environment and wildlife and support the objectives of the National Biodiversity Action Plan;*
> - *Developing and utilising licensing and consent systems to facilitate sustainable activities within Natura 2000 sites;*
> - *Continued research, survey programmes and monitoring of habitats and species.'*

<u>The National Development Plan</u>

The National Planning Framework and the National Development Plan will continue to align and form a single vision for Ireland under Project Ireland 2040.

The National Development Plan also lists the following items as strategic investment priorities in relation to National Heritage and biodiversity:

- *'Implementation of the current and future National Biodiversity Action Plan, delivery of National Parks and Wildlife Service Farm Plans and LIFE projects, enhanced wildlife crime investigation capacity and identification and delivery of conservation measures at designated sites as identified in the Prioritised Action Framework for Ireland (2021-2027)';*
- *'Investment in nature and biodiversity, to improve the quality of natural habitats and support native plants and animals, including those under threat, and to bolster broader societal wellness and sustainability goals.';* and,
- *'Future-proofing obligations under the Biodiversity Strategy 2030, including potential national designations and the preparation and delivery of a National Restoration Plan.'*

6.3.2.2 Ireland's 4th National Biodiversity Action Plan 2023 - 2030

The 4th National Biodiversity Action Plan ('NBAP') 2023-2030 sets out a number of strategic objectives that lay out a clear framework for Ireland's approach to biodiversity and demonstrates Ireland's commitment to protect our biodiversity and also halt decline [33]:

> *'This National Biodiversity Action Plan 2023-2030 builds upon the achievements of the previous Plan. It will continue to implement actions within the framework of five strategic objectives, while addressing new and emerging issues.'*

The five objectives are as follows:

- **Objective 1**: Adopt a Whole of Government, Whole of Society Approach to Biodiversity;
- **Objective 2**: Meet Urgent Conservation and Restoration Needs;
- **Objective 3**: Secure Nature's Contribution to People;
- **Objective 4**: Enhance the Evidence Base for Action on Biodiversity; and,
- **Objective 5**: Strengthen Ireland's Contribution to International Biodiversity Initiatives.

The following Objective Outcomes were considered relevant to the Proposed Development and this report:

Outcome 2A:

> *'The protection of existing designated areas and protected species is strengthened and conservation and restoration within the existing protected area network are enhanced.'*

Outcome 2D:

> *'Biodiversity and ecosystem services in the marine and freshwater environment are conserved and restored.'*

Outcome 2H:

> *'Invasive alien species ('IAS') are controlled and managed on an all-island basis to reduce the harmful impact they have on biodiversity and measures are undertaken to tackle the introduction and spread of new IAS to the environment.'*

Outcome 3B:

> *'The role of biodiversity in supporting wellbeing, livelihoods, enterprise and employment is recognised and enhanced.'*

Outcome 3C:

> *'Planning and development will facilitate and secure biodiversity's contributions to people.'*

6.3.3 Regional Planning Context

6.3.3.1 The Eastern & Midland Regional Spatial and Economic Strategy 2019-2031

The Eastern & Midland Regional Spatial and Economic Strategy 2019-2031 ('RSES') recognises the need to conserve and enhance biodiversity through coordinated spatial planning in the eastern and midland region.

Under the biodiversity section, the following regional policy objectives relative to the Proposed Development are listed:

RPO 7.16

> *'Support the implementation of the Habitats Directives in achieving an improvement in the conservation status of protected species and habitats in the Region and to ensure alignment between the core objectives of the EU Birds and Habitats Directives and local authority development plans.'*

RPO 7.17

> *'Facilitate cross boundary co-ordination between local authorities and the relevant agencies in the Region to provide clear governance arrangements and coordination mechanisms to support the development of ecological networks and enhanced connectivity between protected sites whilst also addressing the need for management of alien invasive species and the conservation of native species.'*

RPO 10.6

> *'Delivery and phasing of services shall be subject to the required appraisal, planning and environmental assessment processes and shall avoid adverse impacts on the integrity of the Natura 2000 network.'*

6.3.4 Local Planning Context

6.3.4.1 Meath County Development Plan (as varied) 2021-2027

The Meath County Development ('CDP') 2021-2027 contains a number of policies and objectives that relate directly to the protection of biodiversity and natural heritage in the context of the Development At the core of these policies and objectives is the belief that:

> '*Protecting and enhancing our biodiversity and landscapes is vital to the health, well-being and quality of life of our communities and assists societal adaption to the challenges of climate change'*

The policies and objectives of the 'CDP' regarding the natural environment that are relevant to the Development are as follows:

HER POL 27

> *'To protect, conserve and enhance the County's biodiversity where appropriate.'*

HER POL 28

> *'To integrate in the development management, process the protection and enhancement of biodiversity and landscape features wherever possible, by minimising adverse impacts on existing habitats (whether designated or not) and by including mitigation and/or compensation measures, as appropriate.'*

HER POL 31

> *'To ensure that the ecological impact of all development proposals on habitats and species are appropriately assessed by suitably qualified professional(s) in accordance with best practice guidelines – e.g. the preparation of an Ecological Impact Assessment (EcIA), Screening Statement for Appropriate Assessment, Environmental Impact Assessment, Natura Impact Statement (NIS), species surveys etc. (as appropriate).'*

HER POL 32

'To permit development on or adjacent to designated Special Areas of Conservation, Special Protection Areas, Natural Heritage Areas, Statutory Nature Reserves or those proposed to be designated over the period of the Plan, only where the development has been subject to the outcome of the Appropriate Assessment process and has been carried out to the satisfaction of the Planning Authority, in consultation with National Parks and Wildlife.'

HER POL 33

'To have regard to the views and guidance of the National Parks and Wildlife Service in respect of proposed development where there is a possibility that such development may have an impact on a designated European or National site or a site proposed for such designation.'

HER POL 34

'To undertake appropriate surveys and collect data to provide an evidence-base to assist the Council in meeting its obligations under Article 6 of the Habitats Directives (92/43/EEC) as transposed into Irish Law, subject to available resources.'

HER OBJ 33

'To ensure an Appropriate Assessment in accordance with Article 6(3) and Article 6(4) of the Habitats Directives (92/43/EEC) and in accordance with the Department of Environment, Heritage and Local Government Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities, 2009 and relevant EPA and European Commission guidance documents, is carried out in respect of any plan or project not directly connected with or necessary for the management of the site but likely to have a significant effect on a Natura 2000 site(s), either individually or in-combination with other plans or projects, in view of the site's conservation objectives.'

HER OBJ 34

'To protect and conserve the conservation value of candidate Special Areas of Conservation, Special Protection Areas, Natural Heritage Areas and proposed Natural Heritage Areas as identified by the Minister for the Department of Culture, Heritage and the Gaeltacht and any other sites that may be proposed for designation during the lifetime of this Plan in accordance with the provisions of the Habitats and Birds Directives and to permit development in or affecting same only in accordance with the provisions of those Directives as transposed into Irish Law.'

HER POL 35

'To ensure, where appropriate, the protection and conservation of areas, sites, species and ecological/networks of biodiversity value outside designated sites and to require an appropriate level of ecological assessment by suitably qualified professional(s) to accompany development proposals likely to impact on such areas or species.'

HER POL 36

'*To consult with the National Parks and Wildlife Service and take account of their views and any licensing requirements, when undertaking, approving or authorising development which is likely to affect plant, animal or bird species protected by law.'*

HER OBJ 35

'*To ensure that development does not have a significant adverse impact, incapable of satisfactory avoidance or mitigation, on plant, animal or bird species protected by law.'*

HER POL 37

'To encourage the retention of hedgerows and other distinctive boundary treatments in rural areas and prevent loss and fragmentation, where practically possible. Where removal of a hedgerow, stone wall or other distinctive boundary treatment is unavoidable, mitigation by provision of the same type of boundary will be required'.

HER POL 44

'To require all development proposals to address the presence or absence of invasive alien species on proposed development sites and (if necessary) require applicants to prepare and submit an Invasive Species Management Plan where such a species exists to comply with the provisions of the European Communities (Birds and Natural Habitats) Regulations 2011-2015.'

6.4 Receiving Environment

6.4.1 Desk Study Results

6.4.1.1 European Designated Sites

In accordance with the European Commission Methodological Guidance [34] and HER policies 31, 32, 33, of the CDP [35], a list of European sites that can be potentially affected by the Proposed Development has been compiled. Guidance for Planning Authorities prepared by the Department of Environment, Heritage and Local Government [36] states that defining the likely Zone of Influence for the screening and the approach used will depend on the nature, size, location, and the likely effects of the project. The key variables determining whether or not a particular Natura 2000 site is likely to be negatively affected by a project are:

- The physical distance from the Site to the European Designated site;
- The presence of impact pathways;
- The sensitivities of the ecological receptors; and,
- The potential for in-combination effects.

All SPAs and SACs within 15km have been considered to assess their ecological pathways and functional links. As acknowledged in the Office of Public Relations ('OPR') guidelines [37], few projects have a Zone of Influence this large; however, the identification of Natura 2000 sites within 15km has become widely accepted as the starting point for the screening process. For this reason, all SPAs and SACs within 15km have been identified for consideration as part of the screening.

There are 11 European designated sites located within 15km of the Site - these are identified in Figure 6-5 and Table 6-5.

Figure 6-5: European Designated Sites within 15km

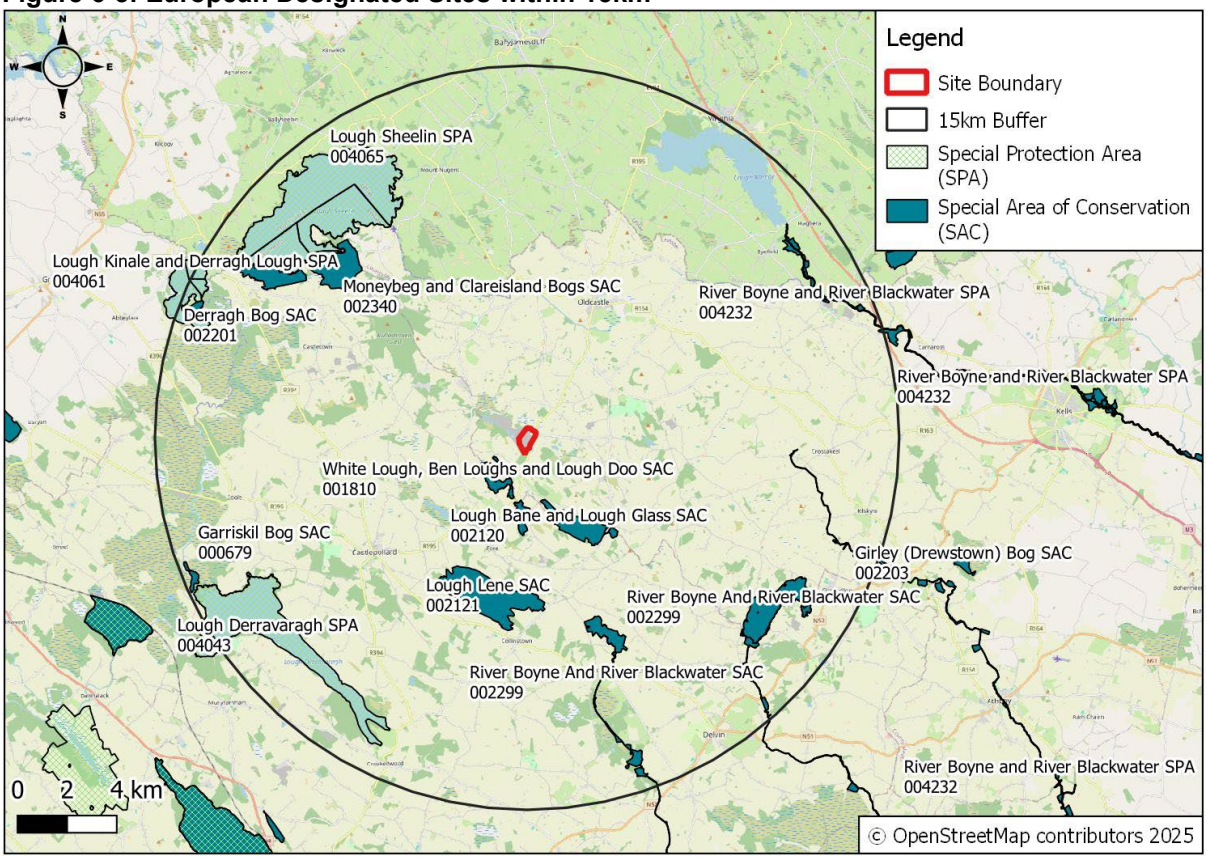


Table 6-5: European Designated Sites within 15km of the Site

Site Name	Code	Distance (km)	Direction from the Site
Special Areas of Conservation ('SAC')			
White Lough, Ben Loughs and Lough Doo SAC	001810	ca. 0.8km	SW
Lough Bane and Lough Glass SAC	002120	ca. 2.0km	SE
Lough Lene SAC	002121	ca. 5.1km	SW
River Boyne and River Blackwater SAC	002299	ca. 7.2km	SE
Moneybeg and Clareisland Bogs SAC	002340	ca. 9.2km	NW
Derragh Bog SAC	002201	ca. 13.9km	NW
Garriskil Bog SAC	000679	ca. 14.0km	SW
Special Protection Areas ('SPA')			
Lough Sheelin SPA	004065	ca. 9.9km	NW
Lough Derravaragh SPA	004043	ca. 11.2km	SW
River Boyne and River Blackwater SPA	004232	ca. 12.3km	NE
Lough Kinale and Derragh Lough SPA	004061	ca. 13.3km	NW

Further consideration to these European Designated sites is provided in the Stage 1 Appropriate Assessment Screening Report (AA) that has been submitted as part of the overall planning application.

6.4.1.2 Nationally Designated Sites

Site designated as Natural Heritage Areas ('NHAs') and proposed Natural Heritage Areas ('pNHAs') within a 5km radius of the Site have been considered in line with the Meath County Development Plan (as varied) 2021-2027.

There are no NHA located within 5km of the Site.

There are four proposed Natural Heritage Areas ('pNHA') identified within 5km of the Site (refer to Figure 6-6 and Table 6-6).

Figure 6-6: Proposed Natural Heritage Areas within 5km of the Site

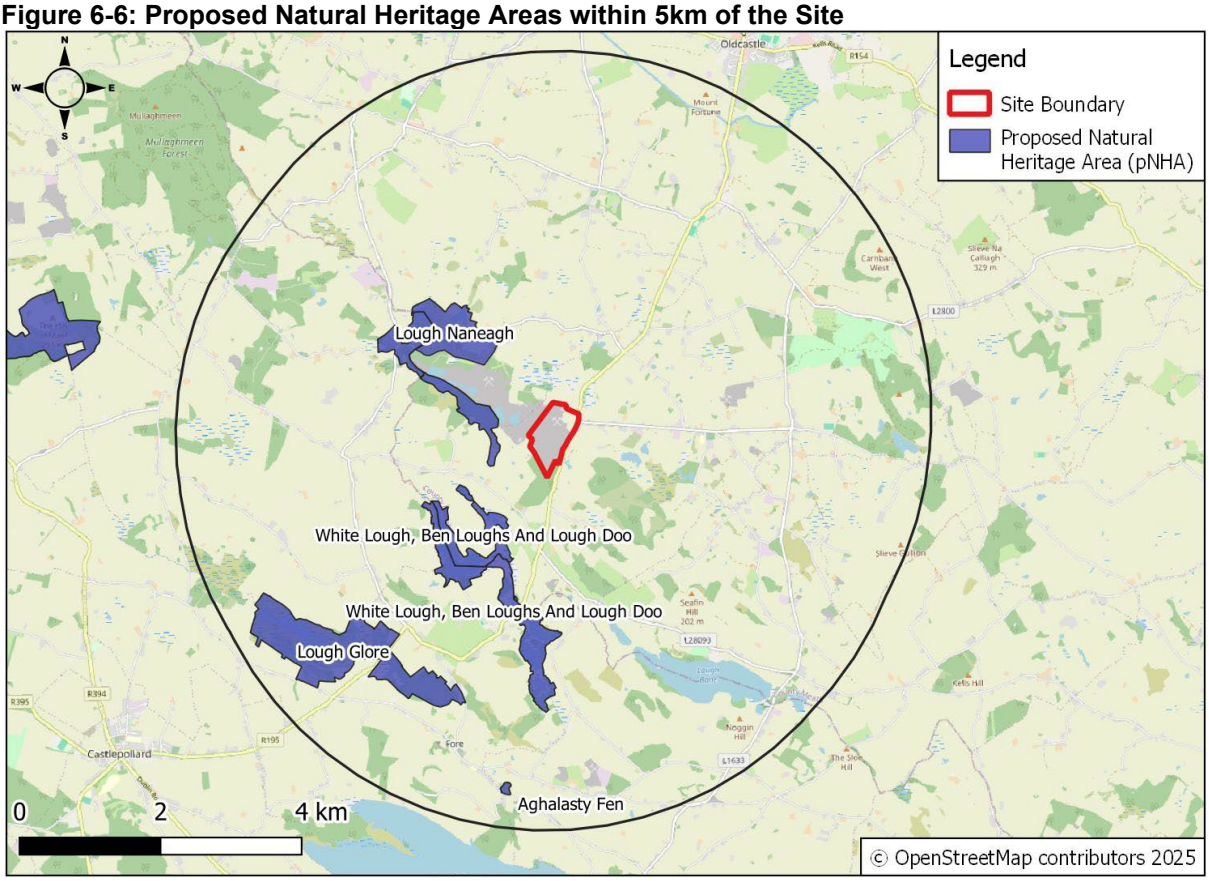


Table 6-6: Proposed Natural Heritage Areas within 5km of the Site

Site Name	Code	Distance (km) & Direction	Qualifying Interest
Proposed National Heritage Areas (pNHA)			
Lough Naneagh pNHA	001814	Ca. 0.43km	Lough Naneagh pNHA comprises a complex of small lakes and wetland areas in an undulating landscape characteristic of glaciation. This pNHA is located ca.10km northeast of Castlepollard and spans the county border between Meath and Westmeath. This pNHA was classified as a locally important site by An Foras Forbartha in 1972 and has been recommended as a pNHA due to the presence of lake habitats and transitional fen. Typical fen vegetation is

Site Name	Code	Distance (km) & Direction	Qualifying Interest
			found alongside bog plants such as heather (*Calluna vulgaris*) and sphagnum moss (*S. capillifolium*) in drier areas within this pNHA. Species-rich grasslands and woodland areas are also present within this pNHA on drumlins and hummocks, increasing the species-diversity within this site.
White Lough, Ben Loughs and Lough Doo pNHA	001810	Ca. 0.82km	There is no site synopsis available for this pNHA from the NPWS.
Lough Glore pNHA	000686	Ca. 3.0km	Lough Glore pNHA is a lake ca.3km northeast of Castlepollard, Co. Westmeath. This pNHA is considered to be a very productive midland limestone lake known for fishing and bird shooting. Lough Glore supports both aquatic vegetation, marginal vegetation and subsequently, a vast array of insect life. This pNHA also supports a variety of bird species including pochard, great-crested grebe, grebe, tufted duck, ringed plover, grey heron, coot, water rail and teal within the lake and snipe, lapwing, curlew, reed bunting and kestrel in the surrounding wetlands. This pNHA is also of conservation importance as it is a known site for otter, a designated species under Annex II of the EU Habitats Directive.
Aghalasty Fen pNHA	000672	Ca. 4.4km	This pNHA is situated in Co. Westmeath. Aghlasty fen is remarkably intact and notable due to its usual fen system which comprises a mat of vegetation floating above a flooded bog. This pNHA is characterised by a transitional plant community which contains plants associated with both fen and bog habitats. Of these species, two unusual bryophytes, *Sphagnum capillaceum* and *Acrocladium stramineum*, are supported.

6.4.1.3 Notable / Protected Species

Table 6-7 provides a summary of records of legally protected or otherwise notable species that occur within 2km of the Site within the last 10 years [18]. The 'NBDC' records were checked on 20th January 2025. The following 'NBDC' 2km grids have been checked: N57B, N57C, N57D, N57G, N57H, N57I, N57L, N57M, N57N [18].

Only species recorded within the past 10 years were included in Table 6-7. The parameter of 10 years was chosen on the basis of habitat and modification, it is considered that any records over 10 years old are not representative of the current distribution of species populations.

Table 6-7: 'NBDC' Records of Notable / Protected Species within 2km of the Site (Grid Codes: N57B, N57C, N57D, N57G, N57H, N57I, N57L , N57M, N57N).

Common Name	*Scientific Name*	Date of last record	Designation
Amphibians			
Common frog	*Rana temporaria*	08/07/2019	Wildlife Acts 1976 / 2000 Habitats Directive Annex V

Common Name	*Scientific Name*	Date of last record	Designation
Smooth Newt	*Lissotriton vulgaris*	29/11/2018	Wildlife Acts 1976 / 2000
Bird Species			
Black Headed Gull	*Larus ridibundus*	08/07/2019	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Amber List
Common Coot	*Fulica atra*	08/07/2019	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex II and III Section I and II Bird Species Birds of Conservation Concern Amber List
Eurasian Curlew	*Numenius Arquata*	08/07/2019	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex II Section II Bird Species Birds of Conservation Concern Red List
Great Crested Grebe	*Podiceps cristatus*	08/17/2019	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Amber List
Mute Swan	*Cygnus olor*	08/07/2019	Wildlife Acts 1976 / 2000 Birds of Conservation Concern Amber List
Bat Species			
Soprano Pipistrelle	*Pipistrellus pygmaeus*	12/10/2015	Wildlife Acts 1976 / 2000 EU Habitats Directive Annex IV
Terrestrial Mammals			
Eurasian Badger	*Meles meles*	29/04/2017	Wildlife Acts 1976 / 2000
Western European Hedgehog	*Erinaceus europaeus*	29/10/2019	Wildlife Acts 1976 / 2000
Irish Stoat	*Mustela erminea subsp. Hibernica*	31/12/2024	Wildlife Acts 1976 / 2000
Invasive species*			
Canadian Waterweed	*Elodea danadensis*	05/07/2016	High Impact Invasive Species Regulation S.I. 374 (Ireland)

*Note: Table includes only invasive species regulated under S.I. 374 (Ireland) [38].

6.4.1.4 I-WeBS Data

I-WeBS data was requested for nearby sites within the vicinity of the Site. The records were reviewed in order to gain an understanding into the potential assemblage of bird populations that may utilise the areas within the vicinity of the Proposed Development.

Data from Wetlands at Grennan / Garrynabolie, Lough Bane and White/Annagh Lough Sites were received (refer to Table 6-1). The data received included available information for the three sites from 2014/2015 winter season to the 2023/2024 winter season.

Overall, 24 species were recorded within the I-WeBS sites. No species were recorded at levels considered to be of International importance. However, one species was recorded in numbers of national importance in the White/Annagh Lough site, see below.

Wetlands at Grennan / Garrynabolie Site – OV055

- The I-WeBS data provided for this site was limited. Data was only available for the 2015/2016, 2016/2017, 2017/2018 and 2019/2020 wintering season;
- A total of 14 species were recorded during this period;
- During the most recent counts, the 2019/2020 winter season, a total of 9 species were recorded; and,
- No species were recorded in numbers of national or international importance.

Lough Bane Site – 0V099

- The I-WeBS data provided for this site included all of the wintering seasons between 2014/2015 to 2023 / 2024;
- A total of 16 species were recorded during this period;
- During the most recent counts, the 2023/2024 winter season, a total of 6 species were recorded; and,
- No species were recorded in numbers of national or international importance.

White/Annagh Lough Site – 0W011

- The I-WeBS data provided for this site included all of the wintering seasons between 2014/2015 to 2023 / 2024;
- A total of 21 species were recorded during this period;
- During the most recent counts available for the 2023/2024 winter season, a total of 10 species were recorded; and,
- No species were recorded in numbers of international importance; however, little grebe were recorded in numbers of national importance during the 2016 / 2017 winter season.

It should be noted that these sites are not located within the immediate vicinity of the Site. As noted in Table 6-1, the nearest records to the Site would be Wetlands at Grennan / Garrynabolie site, which is located ca. 1.3km to the east of the Site.

Therefore, these populations of bird species are not located within close proximity to the Site. Furthermore, it should be noted that none of the species identified are considered to exclusively occur within this area.

6.4.2 Field Survey Results

The following section provides details of the field-based assessments that were undertaken for the Site.

6.4.2.1 Habitat Survey

Site Context and Surrounding Habitats

The Site is located within the existing Murrens Quarry, which has been used to extract and process stone, with origins prior to 1963.

The Site is ca. 40.12ha in size and is primarily comprised of exposed bedrock and some grassland in the northeast, with the main processing area located centrally, along with the settlement canal.

The Site is located within the townland of Murrens and is situated ca. 5.5km south of the town centre of Oldcastle and ca. 7.3km north of the town centre of Castlepollard, which is connected by the R195 Regional Road, which passes along the eastern boundary of the Site. The Site entrance is located in the northernmost corner, onto R195 Regional Road. The R195 immediately to the east of the Site provides the primary transport route for Heavy Goods Vehicles ('HGVs') accessing and egressing the Site.

The lands within the vicinity of the Site are primarily agricultural, with scattered one-off dwelling developments off the R195 and the access road into the Site. The eastern boundary of the Site is bordered by the R195, and the western boundary of the Site is shared with an adjoining quarry development, with an embankment of untouched ground separating the two developments. To the south is a forested area. A description of the habitats and features of ecological significance are outlined below, and their distribution is illustrated in Figure 6-7.

Active Quarry and Mines (ED4)

This habitat was the dominant habitat within the Site. During the survey, steep quarry faces and exposed rock were key features of this habitat.

Given the level of disturbance from quarry works and ongoing stockpile removal works, minimum vegetation was present within this habitat. However, a number of herbaceous plant species were recorded including selfheal (*Prunella vulgaris*), creeping thistle (*Cirsium arvense*), dandelion (*Taraxacum spp.*), oxeye daisy (*Leucanthemum vulgare*), buttercup (*Ranunculus spp.*), black medic (*Medicago lupulina*), white clover (*Trifolium repens*), scarlet pimpernel (*Anagallis arvensis*), yarrow (*Achillea millefolium*), fringed willowherb (*Epilobium ciliatum*), thyme-leaved speedwell (*Veronica serpyllifolia*), coltsfoot (*Tussilago farfara*), hogweed (*Heracleum sphondylium*). bird's-eye pearlwort (*Sagina procumbens*), sycamore saplings (*Acer pseudoplatanus),* wild strawberry *(Fragaria vesca) and* common birds-foot trefoil (*Lotus corniculatus*)*.*

Grass species were also noted within this habitat, including perennial ryegrass (*Lolium perenne*), creeping bent (*Agrostis stolonifera*) and Yorkshire fog (*Holcus lanatus*). In addition, young gorse (*Ulex europaeus*) was noted within this habitat in less disturbed areas.

Buildings and Artificial Surfaces (BL1)

This habitat was located in the northern part of the Site and included buildings such as the Site office and storage sheds. An access road also connected the Site to the R195 regional road from this area.

Vegetation was noted recolonising the road margins, which included dandelion*,* mouse-ear hawkweed *(Pilosella officinarum),* and Yorkshire fog*.*

Recolonising Bare Ground (ED3)

Areas of recolonising bare ground were noted within the main quarry area. These habitats were primarily identified on undisturbed stockpiles within the Site. This habitat was most prominent in the northeast and extended down the central area to the southeast. Over time, these stockpiles have naturally been recolonised by vegetation.

The following species were identified within the recolonising bare ground onsite: mouse-ear hawkweed, dandelion, oxeye daisy, unidentified sphagnum moss species, common hogweed (*Heracleum sphondylium*), yarrow, fringed willowherb, coltsfoot, nettle (*Urtica dioica*), creeping buttercup (*Ranunculus repens*), hairy bittercress (*Cardamine hirsuta*), bramble (*Rubus fructicosus*), common chickweed (*Stellaria media*), bull thistle, broad-leaved dock (*Rumex*

obtusifolius), white clover, daisy (*Bellis perennis*), tansy ragwort (*Jacobaea vulgaris*), apple tree(*Malus spp*.), giant horsetail (*Equisetum telmateia*), hedge bindweed (*Calystegia sepium*) and common milkwort (*Polygala vulgaris*) and cleavers (*Galium aparine*).

Grasses, such as creeping bent, Yorkshire fog and orchard grass (*Dactylis glomerata*) were also identified growing within this habitat. In addition, immature willow (*Salix spp*.), hawthorn (*Crataegus monogyna*) and sycamore trees were identified scattered throughout the recolonising bare ground onsite. Butterfly bush (*Buddleja davidii*) was also noted in this habitat.

Improved Agricultural Grassland (GA1)

Improved agriculture grassland was present on the north-east corner of the Site, with its northern boundary adjacent to the Site access track. The grassland area was ca. 1.02ha in size. It was bounded to the north by a managed hedgerow, to the west by hedgerow / treeline, to the south by an earth bank and to the east by concrete fencing.

The following species were noted within the grassland: Perennial rye grass *(Lolium perenne*), buttercup, creeping bent, hawks-beard (*Crepis spp*.), dandelion, yarrow, white clover, ribwort plantain (*Plantago lanceolata*), broad-leaved dock, ragwort, thistle (*Circium spp*.), hairy willowherb (*Epilobium hirsutum)* and hogweed. Some bramble was noted encroaching from hawthorn saplings.

Earth Banks (BL2)

Earth banks were located in the northeastern region of the Site, forming field boundaries within and bordering the Site. An earth bank was also located in the southwest corner of the Site.

The earth banks were covered in ruderals, weeds and grasses. The following species were noted in this habitat: Yorkshire fog, dandelion, thistle, bramble, yarrow, common hogweed, daisy, bull thistle, tansy ragwort, willow saplings, butterfly bush, nettle, white clover, ribwort plantain, creeping bent, gorse, creeping buttercup, orchard grass, broad-leaved dock, colts-foot, hawksbeard *(Crepis spp*.), and hairy willowherb.

Hedgerow / Treeline (WL1 / WL2)

Hedgerows / treelines and managed hedgerows were identified onsite during the field survey.

Hedgerows / treelines bordered the majority of the eastern boundary and the southern and western boundaries of the Site. In addition, a small section of hedgerow/treelines was present along the northern boundary of the Site. The dominant species identified within these linear habitats were hawthorn, sycamore, ash *(Fraxinus excelsior)* and hazel *(Corylus avellana).*

The understorey of the hedgerow / treelines comprised of bramble, dandelion, hogweed**,** broadleaved dock, gorse, nettle, tansy ragwort, buttercup, ivy (Hedera helix), young holly (*Ilex acquifolium)*, wild carrot (*Dacus carota*), hart's-tongue fern (*Asplenium scolopendrium*), dog rose (*Rosa canina*), box-leaf honeysuckle *(Lonicera niteda),* silvergreen byrum moss (*Bryum argenteum*), bracken (*Pteridium aquilinum)* and grasses included creeping bent, Yorkshire fog and perennial ryegrass.

Managed hedgerows were located within the northern portion of the Site, at the entrance to the quarry. These managed hedgerows ran along both sides of the access road and extended down to the weighbridge. These hedgerows primarily consisted of Monterey cypress (*Cupressus macrocarpa*). A section of young hawthorn hedgerow was located in the southwest portion of the Site.

Mixed Broadleaved woodland (WD1)

A small area of mixed broadleaved woodland was located in the northwestern corner of the Site. The species identified within this habitat included: sycamore, honeysuckle, ash, gorse, willow, elder *(sambucus nigra),* hawthorn and cotoneaster *(cotoneaster spp.).*

Scrub (WS1)

This habitat was found mainly in the western portion of the Site. However, scattered scrub was also identified within the central region of the Site.

The scrub habitats onsite comprised of gorse, willow, holly and sycamore. The understory comprised of brambles, dandelion, ash saplings, creeping bent, bracken, hogweed, clover, horsetail (*Equisetum arvense*), ribwort plantain, common rush (*Juncus effusus*), ground ivy (*Glechoma hederacea*) and black cottonwood (*Populus trichocarpa*). Butterfly bush was also recorded in scrub habitats onsite.

Other Artificial Lakes and Ponds (FL8)

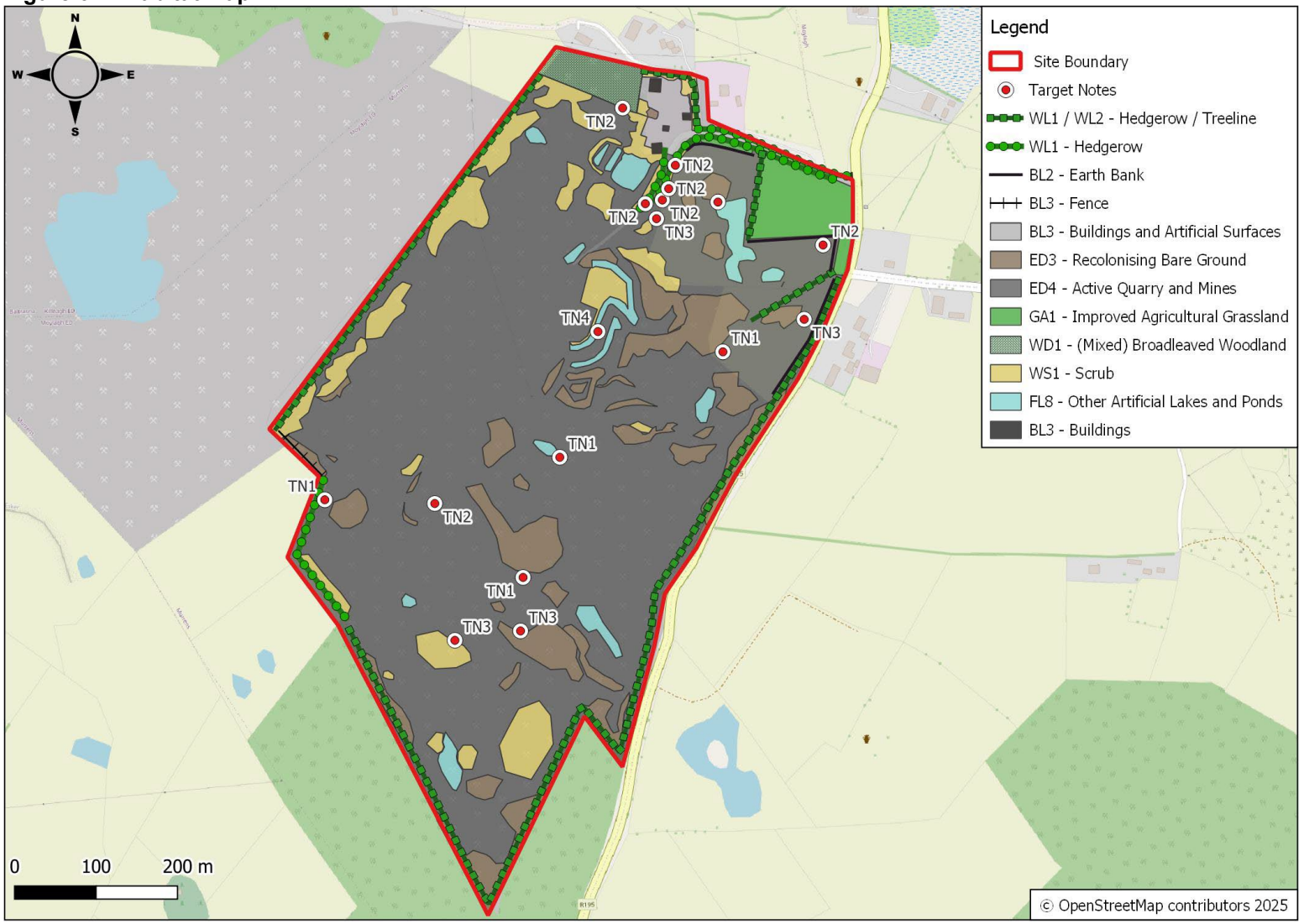
A number of ponds were located within the Site. The majority of these ponds appeared to be seasonal, pluvial surface water ponds. No botanical species were noted within these ponds. See Figure 6-7 for the location of these ponds.

However, as discussed in Section 3.5.3, the onsite looped water settlement system utilised three settlement ponds and a settlement canal. These features were located within the north-central area of the Site at the time of the survey and formed part of the water treatment system implemented onsite.

Species identified around these waterbodies included common rush, bog bullrush (*Schoenoplectiella mucronata*), broadleaf cattail (*Typha latifolia*)**,** shield fern (*Polystichum setiferum*), knapweed (*Centaurea nigra*), duckweed (*Lemna minor),* hawthorn saplings, willow, bramble, ribwort plantain, horsetail, thistle and nettle.

In addition, one invasive species was recorded in this habitat, butterfly bush.

Figure 6-7: Habitat Map



6.4.2.2 Notable / Protected Species

Flora

No notable or protected plant species were recorded onsite during the field surveys, i.e. plants listed on the Flora (Protection) Order 2022 (S.I. No. 235/2022) or on Ireland Red List No. 10: Vascular Plants [30]

Amphibians

The NBDC held records of common frog and smooth newt within 2km of the Site within the last 10 years [18].

Amphibians require static or slow-moving water bodies in order to successfully lay their eggs and tend to favour shallow areas where they are less susceptible to being preyed on by fish. During the walkover, no common frog spawn or smooth newts were observed on the Site.

The field survey conducted on 16th January 2025 did identify suitable habitats for amphibians within the Site by way of settlement ponds and a settlement canal within the northwest section of the Site. These features appeared to be wet year-round and supported marginal vegetation.

There were also areas of temporary surface water throughout the Site. As described in Section 6.4.2.1, these features appeared to be seasonal. However, some of these pluvial surface water ponds were also noted as having the potential to support amphibians

Targeted Amphibian surveys conducted on 20th March, 31st March, 7th April and 24th April 2025 confirmed the presence of amphibians in 12 out of the 14 ponds onsite.

No frog spawn was recorded during any of the surveys; however, tadpoles were observed in Ponds 6 and 8, and one dead frog was noted in Pond 13. Smooth newts were recorded in 12 of the 14 ponds, with the highest numbers observed in Ponds 7 and 9, where adults and juveniles were present.

Smooth newts were recorded in Ponds 1,2, 4, 5, 6, 7, 8, 9, 10, 11, 12 and 13. No newts were recorded in Ponds 3 and 14. The common frog and tadpoles were recorded within Ponds 6, 8, 9 and 13.

See Amphibian Report in Appendix 6-1 for full details of methodologies and results of the surveys undertaken.

Badger

The NBDC held records for badger within 2km of the Site in the past 10 years [18].

The field survey recorded evidence of badger activity in the form of prints (refer to Target Note (TN1) in Figure 6-7). However, no scat, latrines or confirmed setts were identified onsite.

During the field survey, a large mammal hole was identified atop a steep bank along the northern boundary of the Site. This mammal hole was subject to a camera trap survey, which did not identify any mammal activity. This mammal hole was outside of the main quarry area.

Given the disturbed nature of the Site, which is primarily associated with bare or recolonising ground, foraging opportunities for badger were considered limited. Suitable habitats for sett construction were also considered limited.

Therefore, badgers may be utilising the Site but given the absence of suitable foraging habitats, it is not considered that the Site is of significant value for this species.

Bats

The NDBC held records of one of the nine resident Irish bat species within 2km in the past 10 years - Soprano Pipistrelle [18].

No bat roost potential trees or buildings were identified within the Site during the field survey. The hedgerows / treelines bordering the Site have the potential to support commuting and foraging bats. However, these habitats were considered suboptimal for this purpose given the quarrying works undertaken at the Site. According to the 'NBDC' landscape suitability metric, the Site and surrounding area are of low habitat suitability for bats (Landscape Suitability Metric Score 13 – 21).

In addition, the network of ponds onsite had the potential to support foraging bats but given the absence of dark corridors / linear features connecting these waterbodies to the wider landscape, it is not considered that these features are commonly frequented by bats.

It is not considered that the Site is of significant value for bats.

Breeding Birds

The NBDC held records of a number of protected bird species within the 2km of the Site in the past 10 years [18].

The bird species identified onsite or flying over the Site during the habitat surveys in January 2025. A total of eight bird species were recorded during these field surveys and are listed below according to the Birds of Conservation Concern in Ireland Report ('BoCCI') 2020-2026 classifications:

The eight species recorded onsite during the field survey included:

- Seven Green-Listed Birds BoCCI, non- annex I, species were recorded - blackbird (Turdus merula), robin (*Erithacus rubecula*), wren (*Troglodytes troglodytes*), goldfinch (*Carduelis carduelis*), long tailed tit (*Aegithalus caudatus*), chaffinch (*Fringilla coelebs*) and buzzard (*Buteo buteo*); and,
- One Amber-listed BoCCI, non-annex I, species were recorded – linnet *(Linaria cannabina).*

The hedgerow / treelines located along the Site boundaries were noted as having the potential to provide suitable nesting habitat for a range of common bird species. However, no disused or active nests were identified during the field survey.

A total of 28 species were recorded either within or flying over the Site during the 19th March, 9th April and 2nd May 2025 transect surveys. Of these species, 23 birds were observed singing, calling, foraging, and displaying territorial behaviours and were classified as '*possible breeding*.'

Of the 25 species that were recorded:

1. 21 Green-listed BoCCI, non-annex I, species were recorded – blackbird, blackcap (*sylvia atricapilla*), blue tit (*cyanistes caeruleus*), chaffinch, dunnock (*prunella modularis*), goldfinch, great tit (*parus major*), hooded crow (*corvus cornix*), jackdaw (*corvus monedula*), peregrine falcon (*falco peregrinus*), pied wagtail (*motacilla alba yarrellii*), rook (*corvus frugilegus*), siskin (*spinus spinus*), song thrush (*turdus philomelos*), stonechat (*saxicola rubicola*), wood pigeon (*columba palumbus*), wren, robin, raven *(Corvus corax),*Sparrowhawk (A*ccipiter nisus)* and Whitethroat*(Sylvia communis);*
2. Five Amber-listed BoCCI, non-annex I, species were recorded - house sparrow (*Passer domesticus*), sand martin (*Riparia riparia*), linnet (*Carduelis cannabina*), mallard (*Anas platyrhynchos*), willow Warbler (*Phylloscopus trochilus*); and,
3. Two Red-listed BoCCI, non-annex I, species were recorded –meadow pipit (Anthus pratensis), redwing (Turdus iliacus).

The results of these surveys are fully detailed below in Table 6-8

Table 6-8: Breeding Bird Survey Results

BoCCI Status	Species	Latin Name	Number Recorded			Notes	Breeding Status
			Visit 1	Visit 2	Visit 3		
Green-Listed	Blackbird	*Turdus merula*	4	3	5	Visit 1 One individual was observed calling along the southwest boundary of the agricultural grassland. Another individual was observed flying across the agricultural grassland into the hedgerow / treeline on the southwest boundary. Two individuals were flushed by the surveyor at the western boundary of the Site. Visit 2 One individual was observed calling and singing within the woodland north of the Site. Two individuals were observed calling from the hedgerow / treeline along the eastern boundary of the Site. Visit 3 One individual was observed perched in a hedgerow / treeline, and another was observed singing in the north of the Site. Two individuals were observed flying within the woodland located in the north of the Site. Another individual was seen on the ground foraging along the western boundary of the Site. Two blackbirds were observed singing while foraging along the scrub.	Possible Breeding
	Blackcap	*Sylvia atricapilla*	0	1	3	Visit 1 No blackcaps were recorded during visit 1. Visit 2 One individual singing within the hedgerow separating the agricultural fields from the quarry. Visit 3 Two individuals were observed calling and singing in the hedgerow / treeline in the northern section of the Site. Another individual were observed singing along the woodland in the northern section onsite.	Possible Breeding

BoCCI Status	Species	Latin Name	Number Recorded			Notes	Breeding Status
			Visit 1	Visit 2	Visit 3		
	Blue tit	*Cyanistes caeruleus*	1	1	3	Visit 1 One individual was identified singing within hedgerow / treeline that divides the agricultural grassland from the quarry. Visits 2 One individual was observed flying between the stockpiles located on the eastern boundary of the Site. Visit 3 Two individuals were observed calling along the hedgerow / treeline and the earth bank on the eastern boundary. One individual was observed singing along the hedgerow / treeline on the western boundary of the Site.	Possible Breeding
	Chaffinch	*Fringilla coelebs*	6	6	5	Visit 1 One individual was observed perching within the southwest hedgerow/treeline located in the agricultural grassland that separates the Site from the quarry. Another individual was heard calling from a berm to the east of the agricultural land. Two individuals were recorded perching and calling from the hedgerow/treeline to the north of the quarry. An additional two individuals were observed perching and foraging on the ground among the stockpiles along the eastern boundary of the Site. Visits 2 Two chaffinches were observed perched and calling along the southwest hedgerow/treeline within the agricultural grassland onsite. Three individuals were observed calling and singing within the woodland located to the north of the Site. One individual was observed perched and calling between the stockpiles in the centre of the quarry. Visit 3	Possible Breeding

BoCCI Status	Species	Latin Name	Number Recorded			Notes	Breeding Status
			Visit 1	Visit 2	Visit 3		
						Five individuals were observed singing and calling within hedgerow / treeline throughout the Site.	
	Dunnock	*Prunella modularis*	0	2	1	Visit 1 No Dunnocks were recorded during Visit 1 Visit 2 One dunnock was observed flying along the site's eastern boundary, and another was observed flying between the stockpiles in the quarry's central area. Visit 3 One dunnock was observed singing within woodland located in the north of the Site.	Possible Breeding
	Goldfinch	*Carduelis carduelis*	0	5	25	Visit 1 No goldfinches were recorded during visit 1. Visit 2 Three individuals were observed perched and singing within the hedgerow/treeline in the southeast boundary of the agricultural grassland. Two individuals were observed flying across the stockpiles on the eastern boundary of the Site. Visit 3 23 individuals were observed flying and calling over the quarry. Another two individuals were seen singing along the hedgerow / treeline on the western boundary of the Site.	Possible-Breeding
	Great Tit	*Parus major*	3	5	1	Visit 1 Two individuals were observed flying from the berm that separated the agricultural grassland from the quarry and perched in the hedgerow / treeline on	Possible Breeding

BoCCI Status	Species	Latin Name	Number Recorded			Notes	Breeding Status
			Visit 1	Visit 2	Visit 3		
						the eastern boundary. Another individual was heard calling from the hedgerow/ treeline along the agricultural grassland. <u>Visit 2</u> One individual was observed singing along the hedgerow/ treeline in the agricultural grassland. One individual was heard calling from the woodland located on the northern boundary of the Site and another was heard calling from the hedgerow / treeline on eastern boundary of the Site. Two great tits were observed flying between stockpiles in central of the quarry. <u>Visit 3</u> One great tit was recorded singing along the western boundary of the Site.	
	Hooded crow	*Corvus cornix*	0	3	0	<u>Visit 1</u> No hooded crows were recorded during visit 1 <u>Visit 2</u> Three hooded crows were observed flying southeast across the Site. <u>Visit 3</u> No hooded crows were recorded during visit 3.	Non-breeding
	Jackdaw	*Corvus monedula*	1	11	24	<u>Visit 1</u> One jackdaw was observed flying east across the agricultural grassland onsite. <u>Visit 2</u> Four jackdaws were observed carrying nesting material into a building onsite and two nests were observed under the shutters of the building located at the north of the Site. Four individuals were observed perched within the woodland located in the north of the Site. Three individuals were observed perched within the hedgerow/ treeline along the western boundary. <u>Visit 3</u>	Possible-Breeding

BoCCI Status	Species	Latin Name	Number Recorded			Notes	Breeding Status
			Visit 1	Visit 2	Visit 3		
						Four individuals were observed mobbing a sparrow hawk along the hedgerow / treeline along the eastern boundary of the Site. 17 individuals were observed perching and calling within the hedgerow / treeline in the north section of the Site. Three were seen flying across the Site from the western boundary.	
	Raven	*Corvus corax*	0	0	2	Visit 1 No raven was recorded during visit 1. Visit 2 No raven was recorded during visit 2. Visit 3 Two individuals were seen flying across the Site, while calling.	Non Breeding
	Robin	*Erithacus rubecula*	2	3	3	Visit 1 One individual was identified perching within the hedgerow and one individual was recorded perching in the scrub dividing the Site from the quarry. Visit 2 One individual was observed perching and singing within the hedgerow / treeline along the southeast boundary of the agricultural grassland. One individual was observed perched on a wheel located in the northern boundary of the Site, along the woodland. One individual was perched, calling from a stockpile along the western boundary. Visit 3 One individual was observed singing along the eastern boundary of the Site and another two were observed foraging on the ground along the western boundary.	Possible Breeding
	Rook	*Corvus frugilegus*	6	0	13	Visit 1	Non-breeding

BoCCI Status	Species	Latin Name	Number Recorded			Notes	Breeding Status
			Visit 1	Visit 2	Visit 3		
						Five individuals were observed flying over the Site and into the woodland south of the quarry. One individual was observed flying northwest along the western boundary of the Site. <u>Visit 2</u> No rooks for observed during visit 2. <u>Visit 3</u> Ten individuals were observed perching and calling within the hedgerow / treeline along the Site's eastern boundary. Three others were seen flying over the Site heading south.	
	Peregrine Falcon	*Falco peregrinus*	0	2	0	<u>Visit 1</u> No peregrine falcons were recorded during the breeding bird survey; an peregrine falcon survey was conducted; see below for details. <u>Visit 2</u> Two individual's male and female were observed flying and hunting a woodpigeon at 8:30 along the eastern boundary of the Site. At 8:45, two individuals were observed perched along the cliff edge of the quarry located in the eastern boundary of the Site, then flew south towards the woodland located off-site. At 9.30, the two individuals were observed flying from the western boundary toward the eastern boundary of the Site. <u>Visit 3</u> No peregrine falcons were recorded during the breeding bird survey.	Possible Breeding
	Pied Wagtail	*Motacilla alba yarrellii*	4	1	2	<u>Visit 1</u> One individual was observed on the ground at the weight bridge located in the north of the Site. Two individuals were observed flying across the stockpiles in the centre of the quarry. And another individual was observed flying northwest towards north boundary of the Site. <u>Visit 2</u>	Possible Breeding

BoCCI Status	Species	Latin Name	Number Recorded			Notes	Breeding Status
			Visit 1	Visit 2	Visit 3		
						One individual was observed on the ground foraging beside the access track into the quarry. Visit 3 Two individuals were observed calling, singing, and flying over the quarry in the south corner of the Site.	
	Siskin	*Spinus spinus*	0	2	0	Visit 1 No siskins were observed during visit 1. Visit 2 Two individuals were observed on the ground between the stockpiles within the centre of the Site. Visit 3 No siskins were observed during visit 3.	Possible Breeding
	Song thrush	*Turdus philomelos*	0	4	2	Visit 1 No song thrush was observed during visit 1. Visit 2 Two individuals were observed singing and foraging on the ground within the agricultural grassland, and another one was observed singing along the hedgerow / treeline along the western boundary of the agricultural grassland. One individual was observed foraging between the stockpiles along the western boundary of the Site. Visit 3 Two individuals were observed singing within the scrub on the western boundary of the Site.	Possible Breeding
	Sparrowhawk	*Accipiter nisus*	0	0	1	Visit 1	Non-Breeding

BoCCI Status	Species	Latin Name	Number Recorded			Notes	Breeding Status
			Visit 1	Visit 2	Visit 3		
						No sparrowhawk was recorded during visit 1. <u>Visit 2</u> No sparrowhawk was recorded during visit 2. <u>Visit 3</u> One individual was observed being mobbed by jackdaws along the hedgerow / treeline along the eastern boundary of the Site.	
	Stonechat	*Saxicola rubicola*	1	0	2	<u>Visit 1</u> One individual was observed perched on a bramble within the stockpiles located in the centre of the quarry. <u>Visit 2</u> No stonechats were recorded during visit 2. <u>Visit 3</u> Two individuals were observed calling within the scrub along the eastern boundary.	Non-Breeding
	Wood pigeon	*Columba palumbus*	5	6	9	<u>Visit 1</u> One individual was recorded flying along the access track into the quarry. Another was observed flying into a hedgerow located along the northern boundary of the access track, carrying nesting material. Two individuals were observed flying into the treeline on the southern boundary of the Site. One individual was observed perching in the woodland located to the north of the Site. <u>Visit 2</u> Three individuals were recorded singing and flying within the hedgerow/ treeline on the southeast boundary of the agricultural grassland. One individual was observed flying across the stockpiles within the centre of the quarry. Two individuals were observed flying across the Site toward the woodland offsite.	Possible Breeding

BoCCI Status	Species	Latin Name	Number Recorded			Notes	Breeding Status
			Visit 1	Visit 2	Visit 3		
						Visit 3 Four individuals were recorded calling and flying within the hedgerow/ treeline on the eastern boundary. Three individuals were recorded flying within woodland in the north of the quarry. Another two were seen flying along the western boundary of the Site.	
	Wren	*Troglodytes troglodytes*	4	3	8	Visit 1 Two individuals were recorded singing from the hedgerow/treeline along the southeast boundary of the agricultural grassland. Another individual was heard alarm calling from the treeline along the southern boundary of the Site. An additional individual was observed perching and alarm calling from vegetation surrounding the settlement ponds located to the north of the Site. Visit 2 Three individuals were recorded alarm calling within the hedgerow / treeline along the eastern boundary of the Site. Visit 3 Eight individuals were observed calling within the hedgerow / treeline along the boundaries of the Site.	Possible Breeding
	Whitethroat	*Sylvia communis*	0	0	4	Visit 1 No whitethroat was recorded during visit 1. Visit 2 No whitethroat was recorded during visit 2. Visit 3 Three individuals were heard calling along the western boundary of the Site. Another one was heard calling along the eastern boundary of the Site.	Possible Breeding

BoCCI Status	Species	Latin Name	Number Recorded			Notes	Breeding Status
			Visit 1	Visit 2	Visit 3		
Amber-Listed	House Sparrow	*Passer domesticus*	1	0	0	Visit 1 One individual was heard calling from the hedgerow / treeline along the southwest boundary of the agricultural grassland. Visit 2 No house sparrows were recorded during visit 2. Visit 3 No house sparrows were recorded during visit 3.	Possible Breeding
	Sand Martin	*Riparia riparia*	16	80+	78+	Visit 1 Seven individuals were observed flying and displaying above the agricultural grassland located to the northeast of the Site. Five individuals were recorded flying and displaying over the quarry, and a further four were observed flying and displaying above the berm and nest holes situated in the northeast of the Site. Visit 2 Multiple individuals were observed flying across the agricultural grassland, over the hedgerow/treeline in the southeast of the fields, and across to the quarry. Several individuals were seen gathering and flying / displaying together before heading south, later returning to rejoin and form a larger group. Forty plus individual were observed flying above the nest holes located in northeast corner of the Site. Visit 3 32 adults were observed flying over the quarry and foraging throughout the Site. Four new locations of nesting holes were observed along the hedgerow / treeline which runs beside the weight bridge into the quarry. There were 46 individuals observed flying out of these nesting hole locations.	Possible Breeding
	Linnet	*Carduelis cannabina*	0	5	19	Visit 1	Possible Breeding

BoCCI Status	Species	Latin Name	Number Recorded			Notes	Breeding Status
			Visit 1	Visit 2	Visit 3		
						No linnets were recorded during visit 1 <u>Visit 2</u> Two individuals were recorded calling and foraging within the hedgerow / treeline along the southwest boundary of the agricultural grassland. Two individuals were observed perched / calling between the stockpiles on the Site's eastern boundary. Another individual was observed perched and alarm calling within the scrub located beside the settlement ponds. <u>Visit 3</u> 13 individuals were observed perching and calling within the hedgerow / treeline along the eastern boundary of the Site. Six individuals were observed on the western boundary perched.	
	Mallard	*Anas platyrhynchos*	0	4	2	<u>Visit 1</u> No mallards were recorded during the visit 1. <u>Visit 2</u> Two mallards were observed foraging within a seasonal pond located on the eastern boundary of the Site, and another two were observed foraging within the settlement pond located north of the Site. <u>Visit 3</u> One individual was observed foraging in the pond located in the north of the quarry, and another was seen flying east while calling.	Possible breeding
	Willow Warbler	*Phylloscopus trochilus*	0	3	11	<u>Visit 1</u> No willow warblers were recorded during visit 1 <u>Visit 2</u> Three individuals were observed perched and singing within the woodland located north of the Site. <u>Visit 3</u>	Possible breeding

BoCCI Status	Species	Latin Name	Number Recorded			Notes	Breeding Status
			Visit 1	Visit 2	Visit 3		
						Three individuals were observed singing in the scrub around the settlement ponds in the north of the quarry, and another eight were observed calling from the scrub along the western boundary.	
Red Listed	Meadow Pipit	*Anthus pratensis*	0	6	16	Visit 1 No meadow pipits were recorded during visit 1. Visit 2 One individual was observed flying between the stockpiles on the eastern boundary of the Site. Five individuals were observed flying between the stockpiles in the central area of the quarry. Visit 3 Three individuals were observed singing in the scrub around the settlement ponds in the north of the quarry, and another 10 were observed calling from the scrub along the western boundary. Three were observed singing from the stockpiles within the central quarry.	Possible Breeding
	Redwing	*Turdus iliacus*	2	1	0	Visit 1 One individual was observed carrying nesting material along the southwest hedgerow in the agricultural land, and another was flushed by the surveyor along the hedgerow/ treeline north of the quarry. Visit 2 One individual was observed foraging on the ground within the agricultural grassland onsite. Visit 3 No redwing was recorded during visit 3.	Possible Breeding

Peregrine Falcon

The field survey undertaken in January and March 2025 identified a cliff face on the Site's eastern boundary as suitable for peregrine falcon. This cliff has been created by the quarry activities at the Site. Three target surveys were conducted on 19th March, 9th April and 2nd May 2025.

19th March 2025

During the peregrine falcon survey conducted on 19th March 2025, the survey did not identify any active peregrine falcon nests onsite. However, at 10.30, two adult peregrine falcons (male and female) were observed flying from the southwest, calling each other. One landed on the cliff edge carrying nesting materials, while the other remained circling above calling. The two peregrine falcons were then observed flying north of the Site.

At 11.15, the male peregrine falcon was observed flying from the north of the Site, heading towards the woodland located off the Site to the southeast.

Two peregrine falcons (male and female) were observed flying into the Site from the southeast of the woodland at 11.17. The peregrine falcons were heard calling and observed in courtship flight, which lasted until 11.20, then flew northwest of the Site. Calls were still coming from the northwest of the Site at 11.27, with no visual sightings.

At 12:00, two peregrine falcons came from the southwest and were observed circling the southeast of the Site while displaying and calling to each other before departing southeast towards the woodland offsite. Following the 12:00 sighting, no further peregrine falcon activity was observed, and the survey concluded at 13:00.

9th April 2025

At 11.30, two adult peregrine falcons (male and female) were observed flying from the west of the Site over the stockpiles and headed in an eastern direction. At 11.32, one returned from the northeast and remained circling above the stockpiles, while calling.

At 11.35, one of the peregrines returned from the southeast and landed on a quarry cliff ledge while calling to the other peregrine circling above. The two peregrine falcons were then observed flying south towards the woodland.

Following the 11.35 sighting, no further peregrine falcon activity was observed, and the survey concluded at 13:00.

It should be noted that the same two peregrine falcon was observed during the earlier breeding bird survey at 8.30, 8.45 and 9.30. Refer to Table 6-8 above for details.

2nd May 2025

The peregrine falcon survey conducted on 2nd May 2025 did not identify any active nests onsite. However, a recent kill was identified on the eastern cliff along the Site's boundary. No visual sightings were observed during the survey.

Sand Martin

The field survey undertaken in January 2025 identified potential sand martin nest holes recorded at two locations within the Site (refer to TN2 in Figure 6-7). One was located within the stockpile in the southwest-central area of the Site. The other potential nest holes were located in the northeast corner. Three target surveys were conducted on 19th March, 9th April and 2nd May 2025.

Sand martins require steep or vertical slopes of fine sand. They will tunnel into sand even when it is being excavated and may even tunnel in heaps of loose sand. Both males and females make a horizontal tunnel 45-90cm long with a chamber at the end.

Suitable sites may be used for years. Sites are abandoned once the face slumps, becomes weathered (forming a resistant crust), overgrown with vegetation, or accessible to predators. New tunnels will be dug as the cliff collapses or as old holes become too big.

During the sand martin survey conducted on 19th March, 9th April and 2nd May 2025, sand martins were observed flying and displaying in the wider landholding northeast of the Site boundary. The sand martins were then identified flying and displaying over stockpiles within the Site.

During the survey on the 19th March, sand martins were observed flying and displaying above the nest holes in the Site's northeast corner. There were ca. 56 nest holes identified within the northeast corner of the Site. There were no visuals of the sand martins utilising this stockpile. However, on the 9th April, an additional ca. 25 nest holes were identified under the berm that separates the agricultural grassland from the quarry.

On the 19th March, there were ca. 54 nest holes identified within the stockpile in the southwest-central area of the Site. There were no visuals of the sand martins utilising this stockpile. However, on 9th April, sand martins were observed flying and calling together above the nest holes within the stockpiles.

During the survey on the 2nd May 2025, four new nest holes were identified along the hedgerow / treeline that runs parallel with the weight bridge and leads into the quarry. A total of ca. 128 holes were identified. There were ca. 46 individuals observed flying in and out of these nesting hole locations. Refer to Figure 6-7, TN2.

Additionally, a fifth location was identified northwest across from the settlement ponds. This location contained ca. 15 nest holes. No sand martins were observed flying in or out of this location.

No sand martins were observed utilising the nest holes located in the northeast corner of the Site. However, ca. 54 individuals were observed foraging above. There were no visuals of the sand martins utilising this stockpile located in the centre of the quarry.

Plate 6-1: Sand Martin Nest Holes in Northeast Corner on 19th March 2025

Plate 6-2: The Additional ca.25 Nest holes in Northeast Corner on 9th April 2025

Plate 6-3: Sand Martin Nest Holes within Stockpile in the Southwest-central area of the Site

Plate 6-4: New Nest Hole locations identified on the 2nd May

Invasive Species

No high impact invasive species or plant species listed on the list of Invasive Alien Species under S.I. No 374/2024 of the European Union (Invasive Alien Species) Regulations 2024 [28] was identified on the Site. Butterfly bush (*Buddleja davidii*), a medium invasive species was identified onsite. This species is not currently regulated under S.I.374.

Other Species

Otter

The NBDC did not hold records for otter within 2km of the Site from the last 10 years [18].

The field survey conducted in January 2025 did not identify any signs of otter activity on the Site.

As noted above, there are no designated watercourses or waterbodies located within the Site and the closest EPA designated hydrological feature to the Site is the Bane South (Lough), which is located ca. 305m north of the Site.

The onsite habitats are not considered to be suitable for otters. It is unlikely that otters will have dispersed over 300m into the Site from these hydrological features.

Hedgehog

The NBDC held records of west European hedgehog within 2km of the Site [39]. The earliest from 2007 and the most recent in 2019 [18].

No evidence of hedgehog was identified as part of the field survey undertaken on the Site in January 2025.

As noted above, the west European hedgehog is a common and widespread species typically found in scrub, hedgerows, woodland, and rank grassland habitats.

Therefore, the onsite habitats are not considered suitable for this species.

Irish Stoat

The NBDC held a record of Irish stoat within 2km of the Site within the last 10 years [18].

Studies have shown that Irish occur in most habitats with sufficient cover and occur most often in wooded areas and readily climb trees. They also occur in urban areas such as rat-infested rubbish dumps.

No evidence of this species was identified onsite during the field survey and the onsite habitats are not considered suitable for this species.

Pine Marten

One of the cameras deployed as part of the camera trap survey of the mammal hole located on the northern boundary of the Site captured a photograph of a pine marten (*Martes martes*), See Plate 6-5 below. There is a small area of woodland located to the north of the Site that provides a suitable habitat for pine marten. The onsite habitats provide limited opportunities for foraging, commuting for sheltering pine martens.

Plate 6-5: Camera Trap image of Pine Marten

Fox Scat

The field survey identified fox *(Vulpes vulpes)* scat (TN3); refer to Figure 6-7 for further details.

Mammal Holes

As described above, a larger mammal hole was identified atop a steep bank along the northern boundary of the Site.

In the northeast of the quarry, a small mammal hole was identified during the field survey. This mammal hole had no prints leading into it or out. There is evidence of rabbit prints throughout the Site. It is considered to have been a potential rabbit hole.

No other notable or protected species were identified within the landholding or are considered likely to occur, given the nature of the habitats and activities at the Site and on the adjoining lands.

6.5 Characteristics and Potential Impacts of the Proposed Development

6.5.1 Sensitive Design

Specialist ecological input was a key element of the proposed design, to ensure that the design of the proposed infrastructure works was sensitive to ecological features that occur or may occur within the Site and the surrounding landscape. The key measures relevant for this project have been detailed below:

- A Restoration Plan for the Site has been prepared by MOR Environmental. This plan will be implemented on a phased basis in line with the stages/phases of the Proposed Development. See Section 6.7 for full details of this plan. It includes numerous elements to create a mosaic of habitats onsite. It will include the creation of five new ponds, wetlands, additional hedgerow, a new woodland and the creation of a low-nutrient landscape across the Site;
- The onsite mixed broadleaved woodland will be retained;

- Scrub habitat will remain dispersed amongst the newly created low nutrient landscape;
- All boundary hedgerow / treelines and onsite hedgerows will be retained;
- New hedgerow / treeline of ca. 130m will be planted around the northeast corner of the Site;
- A 5m buffer, where appropriate, will be maintained between retained and newly created hedgerow / treelines and the pit face. Only minor ancillary works can occur within this buffer zone; and,
- All vegetation management will be planned in accordance with relevant legislation and undertaken outside of the period between the 1st March to 31st August to avoid potential disturbance of nesting birds.

6.5.2 Identification of Potentially Significant Effects on Identified Receptors

Based on the methodology that is set out in Section 6.2.3, Table 6-9 sets out the findings of the evaluation of important and legally protected receptors. Each receptor is assessed, and a scoping justification for each receptor is provided for the Construction and Operational Phases combined.

Table 6-9: Valuation of Potential Ecological Receptors

Potential Biodiversity Receptor	Relevant Legislation	Valuation	Scoping Justification	Scoping Result
Protected Sites				
Natura 2000 Sites	European Communities (Natural Habitats) Regulations 1997 (as amended)	Internationally designated sites for conservation.	An Appropriate Assessment (AA) was prepared as part of the overall planning application, in line with policies HER 31, 32, 33 and OBJ 33 of the CDP [35]. The AA concluded that the Proposed Development, either alone or in combination with other plans, would not cause any significant adverse effects on any European designated sites or any of their designated features. Therefore, progression to Stage 2 of the Appropriate Assessment process (i.e. Natura Impact Statement) was not considered necessary. For full details on the assessment refer to the 'AA' submitted as part of planning [40].	Natura 2000 sites have been scoped out from further consideration. Refer to AA submitted as part of planning for full details.
Nationally Designated Sites	Wildlife Act 2000 (as amended)	Nationally designated sites for conservation.	There are no NHAs within 5km of the Site; however, there are four pNHAs. These sites were included in this assessment in-line with policies HER POL 31, 32 and 35 and OBJ 35 of the CDP [35]. There are no direct connections or impact pathways between the Site and these pNHAs, and these have been scoped out from further assessment.	Natural Heritage Areas have been scoped out from further consideration.
Habitats				
Active Quarry and Mines (ED4)	N/A	Low Local Value	This habitat was the dominant habitat on the Site. As part of the Proposed Development there will be an expansion of this habitat, refer to Figure 6-7. The majority of expansion will be to existing bedrock and sand and gravel areas of the existing quarry. However, as this habitat is considered to be of low ecological value, it has been scoped out from further consideration. It should, however, be noted that peregrine falcons were observed within the quarry area and therefore are given further consideration below.	This habitat has been scoped out from further consideration.
Buildings and Artificial Surfaces (BL1)	N/A	No Local Value	This habitat is located in the northern part of the Site and included buildings such as the Site office and storage sheds. An access road also connected the Site to the R195 regional road from this area.	This habitat has been scoped out

Potential Biodiversity Receptor	Relevant Legislation	Valuation	Scoping Justification	Scoping Result
			This habitat has no ecological value, subsequently, any alteration / loss of this habitat is not considered to be significant. Therefore, the impact of the Proposed Development on buildings and artificial surfaces is not significant and this receptor has been scoped out from further consideration.	from further consideration.
Earth Banks (BL2)	N/A	Low Local Value	Earth banks were identified in the northeastern region of the Site, which formed agricultural grassland field boundaries within and bordering the Site. One earth bank, located on the eastern boundary of the improved agricultural grassland section of the Site, will be removed as part of the Proposed Development. However, the site walkover did not identify any features or species of conservation interest utilizing this features during the Site walkover, it was not considered that these banks were of significant value for biodiversity and this habitat has therefore been scoped out from further consideration.	This habitat has been scoped out from further consideration.
Hedgerows / Treelines (WL1 / WL2)	Wildlife Act 2000 (as amended)	High Local Value	Hedgerows / treelines and managed hedgerows were identified onsite during the field surveys. All hedgerow / treelines onsite will be retained as part of the Proposed Development. As part of the Proposed Development, the agricultural field located in northeast of the Site will be removed. However, the hedgerows / treelines that bordered it to the east will be retained throughout the lifetime of the Proposed Development. Retention of this habitat is in line with HER Policy 37 of the CDP. In addition, the proposed Restoration Plan for the Site includes the planting of an additional ca. 130m of a new hedgerow / treeline in the northeast corner of the Site. Refer to Section 6.7. This will result in increase of this valuable ecological feature on the Site and connect to existing hedgerow / treeline on the eastern boundary of the Site. A minimum 5m buffer will be present between the retained and new boundary linear features and areas of ground disturbance. Given the measures that will be implemented to protect the retained trees and hedgerows onsite coupled this receptor has been scoped in for further consideration.	This habitat has been scoped in for further consideration.
Improved Agricultural	N/A	Low Local Value	An area of improved agricultural grassland (ca. 1.02ha) was identified within the northeast corner of the Site which will be removed as part of the Proposed Development, to allow for extraction works.	This habitat has been scoped out

Potential Biodiversity Receptor	Relevant Legislation	Valuation	Scoping Justification	Scoping Result
Grassland (GA1)			This habitat is not considered to be of ecological l value of this habitat type and its common presence in the wider area, this habitat has been scoped out from further consideration.	from further consideration.
Other Artificial Lakes and Ponds (FL8)	N/A	High Local Value	The surveys identified 14 ponds located within the Site. With the exception of the waterbodies associated with the looped water system, the majority of these ponds appeared to be seasonal, pluvial surface water ponds. No botanical species were noted within these ponds. The onsite looped water settlement system utilised three settlement ponds and a settlement canal. These features were located within the north-central area of the Site at the time of the survey and formed part of the water treatment system implemented onsite. Amphibian surveys undertaken in March and April 2025 on these ponds did identify the presence of amphibians within 12 of the ponds. Therefore, the removal of five ponds as part of the Proposed Development will result in the loss of amphibian breeding habitat. Further consideration will therefore be given to these waterbodies. It should be noted that remedial and ecological restoration works proposed will be implemented to offset this habitat loss, as outlined in Section 6.7. This includes the creation of seven new ponds prior to the commencement of aggregate extraction or stockpile removal within areas where ponds are currently located. Given the value of ponds for wildlife and also the use of these ponds by protected species, this habitat has therefore been scoped in for further consideration.	This habitat has been scoped in for further consideration.
Recolonising Bare Ground (ED3)	N/A	Low Local Value	Areas of recolonising bare ground were identified within the main quarry area during the field survey. This habitat was primarily identified on undisturbed stockpiles within the Site. This habitat was most prominent in the northeast and extended down the central area to the southeast. Over time, these stockpiles have naturally been recolonised by vegetation. This habitat will be removed on a phased basis as part of the Proposed Development. However, given its lack of ecological value, this receptor has been scoped out from further consideration for ongoing operations.	This habitat has been scoped out from further consideration.
Scrub (WS1)	Wildlife Act 2000 (as amended)		The surveys identified this habitat mainly in the western portion of the Site, with some scattered scrub also identified within the central region of the Site.	This habitat has been scoped out from further consideration.

Potential Biodiversity Receptor	Relevant Legislation	Valuation	Scoping Justification	Scoping Result
			The majority of scrub habitat on the Site will not be altered as part of the Proposed Development. However, ca. 50% of one of the scattered scrub sections within the centre of the Site will be removed to allow for extraction works. Whilst this habitat has the potential to support protected / notable species, the area being removed was deemed as sub-optimal for such species due to its location within and adjacent to quarry habitat. Therefore, this habitat has been scoped out from further consideration.	
Mixed Broadleaf Woodland (WD1)	Wildlife Act 2000 (as amended)	High Local Value	The field surveys identified this habitat in the northwest corner of the Site. This habitat will not be impacted by the Proposed Development. This is in line with HER Policy 40 the CDP. This receptor has therefore been scoped out from further consideration.	This habitat has been scoped out from further consideration.
Flora and Fauna				
Protected Flora	Flora (Protection) Order 2022 (S.I. No. 235/2022)	N/A	The field surveys did not identify any protected flora species on the Site. It should, however, be noted that this survey was conducted outside of the optimum botanical survey season. As certain species of flora such as red hemp nettle (*Galeopsis ladanum var. angustifolia*), live in niche habitats such as disturbed ground, similar to those found in quarries, a follow up walkover was undertaken on 2nd May 2025 which did not identify any protected species. Therefore, protected flora has been scoped in for further consideration.	Flora have been scoped out from further consideration.
Amphibians	Wildlife Act 2000 (as amended) EU Habitats Directive Annex V	Low Local Value	The Site provides suitable habitat for amphibians, and the surveys undertaken have confirmed the presence of amphibians (smooth newt and common frog) within 12 of the 14 ponds located on the Site. Smooth newts were recorded within 12 Ponds and common frog were recorded within 4 ponds. Refer to Appendix 6- 1 – Amphibian Report for full details. Mitigation measures to avoid impacts on amphibians are presented below. This includes the creation of seven new ponds along with the creation of hibernacula and habitat piles. Refer to Section 6.6.4 for mitigation measures and to Section 6.7 for details of the Restoration Plan. The Proposed Development will result in the loss of five seasonal surface ponds in the north-eastern and southern sections of the Site, which will result in the loss of breeding habitat for	Amphibians have been scoped in for further consideration.

Potential Biodiversity Receptor	Relevant Legislation	Valuation	Scoping Justification	Scoping Result
			both smooth newts and common frog. Therefore, amphibians have been scoped in for further consideration.	
Badgers	Wildlife Act 2000 (as amended)	Low Local Value	The NBDC held records badger within 2km of the Site within the past 10 years. The field surveys undertaken recorded evidence of badger activity in the form of prints (refer to TN1 in Figure 6-7). However, no scat, latrines or confirmed setts were identified onsite. A large mammal hole was identified atop a steep bank along the northern boundary of the Site during the field survey. The camera trap survey undertaken did not identify any badgers utilizing the mammal hole. This mammal hole was outside of the main quarry area and will not be impacted by the removal of the stockpiles or the Proposed Development. Given the disturbed nature of the Site, which is primarily associated with recolonising ground, foraging opportunities for badger were considered limited, as were suitable habitat for sett construction. The Site is therefore considered to be suboptimal for this species. Therefore, badgers may be utilising the Site; however, given the suboptimal nature of the on-site habitats for foraging or sett construction, it is not considered that the Site is of significant value for this species. This species has, therefore, been scoped out from further consideration.	Badgers have been scoped out from further consideration.
Bats	Wildlife Act 2000 (as amended) EU Habitats Directive Annex IV	High Local Value	The NBDC held records of one of the nine resident Irish bat species within 2km in the past 10 years, soprano pipistrelle. The field surveys undertaken at the Site did not identify any trees or buildings with features suitable for roosting bats. The hedgerow / treelines identified on the Site have the potential to be utilised by commuting and foraging bats, in particular the hedgerow / treelines bordering the Site. However, no hedgerow / treelines will be removed as part of the Proposed Development and new hedgerow / treeline of ca. 130m will be created as part of the Restoration Plan. Refer to Section 6.7. Furthermore, the onsite the habitats are not considered to be of significant value to bats. Given that the Proposed Development is unlikely to result in any adverse effects on bats, this receptor has been scoped out from further consideration.	Bats have been scoped out from further consideration.

Potential Biodiversity Receptor	Relevant Legislation	Valuation	Scoping Justification	Scoping Result
Birds	Nesting Birds Wildlife Acts 1976 / 2000 Peregrine Falcon Wildlife Acts 1976 / 2000 EU Habitats Directive Annex I Bird Species Sand Martin Wildlife Acts 1976 / 2000 Birds of Conservation Concern Amber List	High Local Value	Nesting Birds There were 28 species recorded either within or flying over the Site during the 19th March, 9th April and 2nd May 2025 during the transect surveys. The hedgerows / treelines located along the Site boundaries and surrounding the grassland were noted as having the potential to provide suitable nesting habitat for a range of common bird species. However, two active nests were identified in one of the buildings in the north of the Site. All buildings onsite will be retained as part of the Proposed Development. As part of the Restoration Plan (Section 6.7), the following habitats will be created: mixed broadleaved woodland, additional hedgerow / treeline, wet meadow, and low-nutrient habitat. In addition, all existing hedgerows / treelines will be retained as part of the Proposed Development. These habitats will provide suitable nesting habitats for a variety of bird species Additionally, the Restoration Plan will involve the creation of seven new pond habitats along the south to western boundary of the Site. Waterfowl birds are expected to use the Site once quarrying operations cease. These measures will a long-term have positive effect on breeding birds. Peregrine Falcon The site provides a habitat for potential foraging for the peregrine falcon. There were three target surveys on the 19th March, 9th April and 2nd May 2025. High levels of peregrine activity were consistently recorded. The eastern boundary was identified as suitable nesting habitat for peregrine falcon. As part of the Restoration Plan for the Site, it is proposed that the rock faces within the quarry will be retained in benches and allowed to erode naturally to enable the continual creation of bare and disturbed ground through erosion and slippage. It can, therefore, be concluded that suitable breeding habitat for peregrine falcons will be provided throughout the operational lifetime of the Proposed Development and that this habitat will be retained once operations cease. In addition, there is another quarry located west of the Proposed Development in the wider surrounding area which has the potential to support active nests.	Peregrine falcon and Sand Martin has been scoped in for further consideration.

Potential Biodiversity Receptor	Relevant Legislation	Valuation	Scoping Justification	Scoping Result
			Although no breeding peregrine falcons have been confirmed onsite, mitigation measures are required to ensure that no effects occur to peregrine falcons that may use the Site for breeding purposes in the future. <u>Sand Martin</u> Sand martin are commonly associated with quarries as these sites often provide suitable nesting habitat in exposed / disturbed banks. The habitats within the Site boundary do provide suitable nesting habitat for this species. The onsite habitats are also considered to be sub-optimal for foraging sand martin. In addition, sand martin nesting holes were observed at six locations within the Site (TN2 Figure 6-7). These nesting holes were present within the stockpiles in the southwest central area, the northeast corner of the Site and along the hedgerow / treeline parallel to the weight bridge. Sand martins were observed flying above the nest holes in the northeast corner. In addition, as part of the restoration plan, a sand martin embankment will be created to ensure active nesting habitat is retained as restoration progresses through the quarry. However, mitigation measures will be implemented to ensure that no impacts occur to sand martin that may nest onsite in the future. Given the presence of suitable habitat for both peregrine falcon and sand martin these species have been scoped in for further consideration.	
Invasive Species	Species Dependant	N/A	The NBDC held one record of a high impact invasive species within 2km of the Site within the last 10 years, Canadian waterweed. No high impact invasive species or plant species listed on the First Schedule of the 2024 European Union (Invasive Alien Species) Regulations 2024 (i.e. species of which it is an offense to disperse, spread or otherwise cause to grow in any space) were identified onsite. Butterfly bush, a non-regulated invasive species that has the potential to impact local biodiversity, was recorded in multiple habitats on the Site. There are no direct legal provisions associated with butterfly bush. However, standard measures will be implemented in order to ensure no invasive species are introduced to the Site during the phases of the Proposed Development (see Section 6.6.6 below). This is in line with HER policy 44 of the CDP [35].	Invasive species have been screened in for further consideration.

Potential Biodiversity Receptor	Relevant Legislation	Valuation	Scoping Justification	Scoping Result
Other Species	Otter Wildlife Act 2000 (as amended). EU Habitats Directive Annex 11 & IV Hedgehog, Irish Stoat and Fox Wildlife Act 2000 (as amended)	Low Local value	Otter The NBDC held no record of Otter within 2km of the Site, within the last 10 years. The field surveys did not identify any evidence of otter by way of spraints or prints on the Site. The nearest potentially suitable habitat for otter is located ca. 305m north of the Site and it is considered unlikely that otters would have dispersed over 300m into the Site. Given the absence of suitable habitat for this species, this species has been scoped out for further consideration. European Hedgehog The NBDC held records of hedgehog within 2km of the within the past 10 years. [18]. The field surveys did not identify any evidence of this species. Given the open nature of the on-site habitats, it is not considered that the Site is of significant value for this species and this receptor has therefore been scoped out from further consideration. Irish Stoat The NBDC held records Irish stoat within 2km of the Site in the past 10 years. The field surveys did not identify any evidence of this species. Given the open nature of the habitats on the Site, it is not considered that the Site is of significant value for this species and this receptor has therefore been scoped out from further consideration. Pine Marten The camera trap survey at the Site captured an image of a pine martin on the north boundary of the Site. However, no works are scheduled to take place within this part of the Site and the onsite habitats are not considered to be suitable for pine marten. It is therefore considered that no potential impacts will occur and pine marten have been scoped out from further consideration. Fox Three fox scats and footprints were noted within the Site. No fox dens were confirmed present on Site, however as noted above a large mammal hole was identified on the northern boundary. The hole is located outside of the main quarry area and will not be impacted by the removal of the stockpiles. It is not considered that the Proposed Development will have any impact on fox using the area.	Terrestrial mammals have been scoped in for further consideration.

Potential Biodiversity Receptor	Relevant Legislation	Valuation	Scoping Justification	Scoping Result
			However, given the identification of fox scat onsite, standard protection measures for terrestrial mammals will be incorporated into the works in line with HER policy 35 of the CDP [35] and terrestrial mammals have been scoped in for further consideration.	

6.5.3 Summary of Potential Impacts

Following a detailed assessment, the following receptors were identified as significant receptors and were brought forward for further consideration, see Section 6.5.

- Other Artificial Lakes and Ponds (FL8);
- Hedgerow / Treeline (WL1 / WL2);
- Amphibians;
- Birds – Peregrine Falcon and Sand Martin;
- Invasive Species; and,
- Other Fauna – Terrestrial Mammals.

In addition to the species listed above, general mitigation / best practice measures have also been included for the Proposed Development. As noted above, the project presents opportunities for enhancing the area for biodiversity. Further details of ecological enhancement measures are provided below.

6.6 Proposed Remedial and Mitigation Measures

The mitigation and remedial measures outlined below will be incorporated and adhered to during the different phases (Phase 1 to Phase 4) of the Proposed Development to ensure that the works do not result in contravention of wildlife legislation. Please note that there will be no construction of any new infrastructure as part of the Proposed Development.

All works to be undertaken within Phases 1 to 4 of the Proposed Development will comply with all relevant legislation and best practice guidance to reduce any potential environmental impacts. The following guidance relevant to biodiversity will be referred to:

- CIEEM, Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine (2018 and revisions) [1];
- NRA, 'Guidelines for Assessment of Ecological Impacts of National Roads Schemes' [2];
- Guidelines for the Protection of Biodiversity within the Extractive Industry [41];
- Fossit's Guide to Habitats In Ireland [4];
- Heritage Council's 'Best Practice Guidance for Habitat Survey & Mapping';
- NRA, 'Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes;
- C532 – Control of Water Pollution from Construction, Guidance for Consultants and Contractors [12];
- CIRIA C811- Environmental Good Practice on Site (5th edition) [13];
- Guidance for the Treatment of Badgers Prior to the Construction of National Road Schemes [14]; and,
- Guidelines on the Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads [15].

The following mitigation measures will also be incorporated and adhered to in order to ensure that the proposed works do not result in any contravention of wildlife legislation:

- Quarrying and other activities will comply with all relevant legislation and best practice to reduce any potential environmental impacts. The mitigation measures detailed within this EIAR will be fully adhered to;
- The Site manager shall ensure that all personnel working onsite will be trained and made aware of the mitigation measures detailed within this EIAR.
- An Ecological Clerk of Works ('ECoW') will be appointed to the project to oversee the implementation of the restoration and habitat creation works.
- The ECoW will also be available should protected or notable species be encountered during operations at the Site; and,
- In advance of works, all Site personnel will receive a toolbox talk regarding the mitigation measures outlined in the EIAR and AA. Everybody working onsite must understand the role and authority of the ECoW.

An ECoW will inspect the Site in advance of works commencing and will undertake Site inspections as required during the works, to ensure that all works will be completed in line with wildlife legislation.

6.6.1 Protection for Retained and New Hedgerows / Treelines

It will be important to ensure that no unnecessary damage occurs to the hedgerow and treelines onsite and to those being created as part of the Restoration Plan. Care will be required to protect these linear features from both direct and indirect disturbance. The following protection measures will be adhered to during the phases of the Proposed Development;

- All development works will be set back a minimum of approximately 5m from the existing boundary features;
- All hedgerows / treelines that will be located within close proximity to the extraction area will be fenced off;
- New hedgerow / treeline being created as part of the Restoration Plan will require a 5m buffer as a mitigation measure to counteract the visual impact;
- No materials, equipment or machinery will be stored within close proximity to retained hedgerows / treelines;
- In order for treeline protection measures to work effectively, all personnel associated with the operation of heavy plant machinery must be familiar with the above principles for the protection of treelines; and,
- Notice boards, wires, etc., will not be attached to any trees.

6.6.2 Protection for Peregrine Falcon

To ensure that peregrine falcon that may use the Site will be protected from the phases of the Proposed Development, the following measures will be implemented:

- All personnel operating on-site will be made aware of the legal protection afforded to peregrine falcons, and biodiversity signage will be erected throughout the quarry;
- Should a peregrine falcon nest be identified on-site, all personnel operating on the Site will be made aware of the presence and location of the nest. Access will be restricted

below cliffs which are actively being utilised by peregrine falcons. This will be done using fencing and / or other appropriate barriers;

- Infrastructure will not be installed, nor any new material stockpiled, within 25-50m of rock faces supporting peregrine falcon;
- A buffer of 25-50m will be implemented from any identified peregrine falcon nests on-site. If stockpile removal works are required during the breeding season (1st March to 31st August), the ECoW will need to be consulted. This distance may be increased if this buffer is deemed insufficient and peregrine falcon become disturbed due to works on-site;
- As part of the restoration plan for the Site, the quarry ledges will be left in place and unplanted. This will provide suitable breeding habitat for peregrine falcon; and,
- An annual peregrine falcon monitoring programme will be established during the remedial phases of the Proposed Development to establish the potential effects, if any, of the Proposed Development on peregrine falcon. The findings of the monitoring will be submitted to Meath County Council, the National Biodiversity Records Centre and NPWS.

The mitigation measures that will be implemented onsite will ensure that the Proposed Development does not result in undue disturbances to peregrine falcons.

6.6.3 Protection for Sand Martin

To avoid potential impacts as a result of the proposed removal of stockpiles on sand martins, the following mitigation measures will be implemented:

- All personnel operating onsite will be made aware of the presence (including the location) of sand martin nests onsite and the legal protection afforded to this species;
- Annual monitoring for breeding sand martin by the project ECoW will be undertaken for the duration of the remedial works. The report will be submitted to Meath County Council on an annual basis;
- Areas where nesting activity is noted will be clearly marked to ensure disturbance is avoided and routinely monitored, making changes to these marked areas as necessary;
- All exposed faces designated for excavation during the breeding season (1st March to 31st August) will be assessed for their potential to provide breeding sites by February each year under the advice of the ECoW. These areas can then be managed or worked in such a way as to make them unattractive to sand martin so that the removal of stockpiles can continue without interruption. These management procedures include reprofiling the stockpiles to less than 45° or utilising netting to cover nest holes outside the breeding season. This will prevent sand martin from nesting / burrowing within the active areas onsite;
- Old disused / inactive nests will be removed outside of the nesting season under the supervision of the ECoW, to ensure that no birds are utilising the nests, and the nests are fully removed;
- Regular checks of the Site for evidence of sand martin nesting will be undertaken between March and April, particularly after the Site's closures, such as Easter;
- Before the commencement of the nesting season, a suitable aggregate face for sand martins will be set aside. As the phased removal of the stockpiles within the Site progresses, a sand martin embankment will be created to ensure active nesting

habitat is retained as restoration progresses through the quarry, refer to Section 6.7.1 for further details. The sand martin embankment will be sited away from main activities; and,

- Should sand martin be observed nesting within the works area, then the ECoW will be consulted for advice.

6.6.4 Protection for Amphibians

Given the confirmed presence of smooth newt and common frog, the suitable breeding, foraging and sheltering habitat for amphibians, the following remediation / mitigation measures will be implemented to ensure the phased works do not have adverse effects on amphibians.

In order to ensure that the phased works do not have adverse effects on amphibians, the following procedures and mitigation measures will be implemented Refer to Appendix 1 – Amphibian Report for full details:

- The ECoW will supervise the construction and planting of the new ponds to ensure that they are constructed in line with the recommendations below;
- The infilling of the ponds will be scheduled to take place outside of the amphibian breeding season (February - August). The ECoW will inspect and net the ponds prior to infilling and supervise the works to ensure that no amphibians are present;
- The ponds will be constructed at the initial stage of the project and in advance of any known breeding ponds being disturbed / removed;
- Any amphibians that are found during the removal of the five ponds will be relocated to the newly created pond in the western part of the Site; and,
- Should amphibians be encountered during any other activities associated with the Proposed Development, the ECoW will be consulted for advice.

Seven new ponds will be constructed on the Site to compensate for the ponds removed as part of the Proposed Development. In addition, hibernacula and habitat piles will be installed in the landscaped area around these new ponds to support any potential amphibians in the area. See Section 6.7 below.

6.6.5 Protection for Terrestrial Mammals

Whilst the habitats onsite were considered sub-optimal for such species as foraging badger and sett construction, there is potential for badgers and fox to commute through the Site given their widespread abundance across Ireland. Therefore, to ensure that the works in relation to the Proposed Development does not have significant impacts on mammals (including badgers and foxes), works will be in line with the NRA (now TII) guidance for Badgers [14] and HER policy 35 of the CDP [35]. The following mitigation measures will be implemented onsite:

- Should construction works be required outside of daylight hours, the appointed project ECoW will be consulted as required;
- Where deep excavations are required onsite, appropriate measures (such as covers, or fencing) to protect mammals from ingress will be installed as required; and,
- If unidentified burrows are identified within the works area during construction, works will cease within that area and the project ECoW will be contacted for advice.

6.6.6 Measures for Invasive species

To mitigate against the unintentional introduction of invasive species during quarrying operations, the following mitigation measures will be followed in line with HER policy 35 of the

CDP [35] and the NRA guidelines for the management of noxious weeds and non-native invasive plant species [15].

- All vehicles, machinery and any other equipment used for the works will be washed prior to its use at the Site to prevent the import of plant material or seeds;
- Before machinery or equipment is unloaded at the Site, the equipment will be visually inspected to ensure that all adherent material and debris has been removed;
- Any vehicles and machinery that are not clean will not be permitted entry to the Site;
- All materials to be imported to the Site, including additional planting, will be sourced from a reputable supplier, and records of all material and supplies will be maintained;
- In advance of works, all Site personnel will receive a toolbox talk with regards to invasive species; and,
- Everybody working onsite must understand the role and authority of the ECoW managing the issue of the non-native species.

6.7 Restoration Plan

As part of the Proposed Development, a Restoration Plan has been developed as detailed below, which outlines the actions and measures that will be implanted onsite to offset for the loss of habitats following the disturbance from the Proposed Development activities including extraction and infilling works.

The Restoration Plan has been developed taking into consideration both the species that currently utilise the Site and species that have the potential to utilise the area following the completion of works and implementation of the plan. Refer to Figure 6-9 below.

It has also taken into consideration the three stages of the Proposed Development (as outlined in Chapter 3 Section 3.3) in that restoration works will also be undertaken on a phased basis. Due to the nature of the Proposed Development, whereby a large portion of the Site to the south and west will not be impacted by the future activities of the Proposed Development, these areas are considered available for immediate reinstatement. As also outlined in Chapter 3, works relating to the individual stages of the Proposed Development will be undertaken simultaneously.

Table 6-10 below summarises the phasing of the elements of the proposed Restoration Plan as they relate to the stages and phasing of the Proposed Development. Full details of these stages/phases are outlined in Chapter 3 – Section 3.3.

Table 6-10: Restoration Plan Works as they relate to Proposed Development Stages / Phases

Proposed Development	Stage 1 Site Preparation	Stage 2 Site Operation	Stage 3 Restoration
Phase 1	In this phase, seven new ponds will be constructed, each surrounded by a new wetland area. These will be located in the west and southwest sections of the Site, as outlined in Figure 6-9 below. Construction of the ponds is to be undertaken prior to any aggregate extraction within areas where ponds are currently present and prior to the removal of any stockpiles from the Site. A new native species hedgerow / treeline will be created in the northeast corner of the Site prior to commencement of any preparation works or to the quarry floor in the north of the Site. Planting will be undertaken within the first available season (November – March).	Stockpile removal will be undertaken in this phase on a gradual basis. Any stockpile removal will commence in areas where restoration will be undertaken i.e. outside of the proposed extraction areas. This will allow the restoration plan to commence by way of preparation of the land. If there is any delay with stockpile removal (due to market demands) from areas marked for reinstatement, these will be moved to the Proposed Development area of the quarry to ensure no delay to carrying out of restoration works.	Immediate Restoration This phase will be undertaken in tandem with Stage 2 – Phase 2, and in lands to the west and south of the Site that will not form part of the extraction areas of the Proposed Development. A mixed broadleaf woodland will be planted in the southeast corner of the Site within the first available season (November – March). Sand Martin habitat will be created by way of regrading of slopes. Low Nutrient Landscape will be created in areas outside of main extraction activities, i.e., south and west of the Site. Existing areas of scrub will be retained within this low-nutrient landscape.
Phase 2	N/A	To ensure no impact on ongoing restoration works, any stockpiles created as part of the deepening or levelling of the Quarry Floor in the North of the Site can only be stored in the designated working areas of the quarry	N/A

Proposed Development	Stage 1 Site Preparation	Stage 2 Site Operation	Stage 3 Restoration
Phase 3	N/A	To ensure no impact on ongoing restoration works, any stockpiles created as part of the deepening or levelling of the Quarry Floor in the East of the Site can only be stored in the designated working areas of the quarry.	Future Restoration Following completion of the Operational Stage of the Proposed Development, all remaining areas of the Site will be transitioned into Low Nutrient Landscape. This will primarily be the future excavation and operational areas of the quarry. Quarry ledges will be retained and left unplanted. Following cessation of quarry activities at the Site, the remaining ponds on the Site will be retained and allowed to naturalise and form part of the network of ponds / wetland across the Site.

6.7.1 Habitat Creation

As detailed in Table 6-10 above, habitat creation will be undertaken across the Site in order to increase opportunities for a variety of wildlife that are appropriate to the Site and includes proposed woodland, new hedgerow planting, ponds/wetland, wet meadow, scrub retention and the restoration of the quarry habitat to a low nutrient landscape as outlined in Figure 6-9.

Please note that any stockpiled topsoil and subsoil material stored onsite will be used, where required, for this restoration process. The re-use of soil from the Site will help maintain the seed bank and genetic integrity of the area. Where necessary, the importation of non-waste inert soils will be sourced to support restoration work.

6.7.1.1 Proposed Ponds / Wetland

As part of the Restoration Plan, it is proposed to construct seven purpose-built ponds to enhance the availability of suitable breeding and foraging habitats for native amphibian species, particularly the common frog and smooth newt. These new ponds will also remediate for the five ponds that will be lost as part of the Proposed Development.

Each pond has been specifically designed to support amphibian. This includes a combination of deeper open water zones and gradual sloping margins, which will facilitate safe access for amphibians and support a mosaic of aquatic microhabitats.

The measurements of the seven ponds will be as follows:

1. Pond 1: 72m L x 30m W;
2. Pond 2: 68m L x 37m W;
3. Pond 3: 50m L x 33m W;

4. Pond 4: 53m L x 26m W;
5. Pond 5: 42m L x 31m W;
6. Pond 6: 44m L x 36m W; and,
7. Pond 7: 32m L x 31m W.

Pond depths will range from approximately 1 metre to 2 metres to promote variation in temperature and oxygen levels, providing suitable conditions for both egg-laying and larval development.

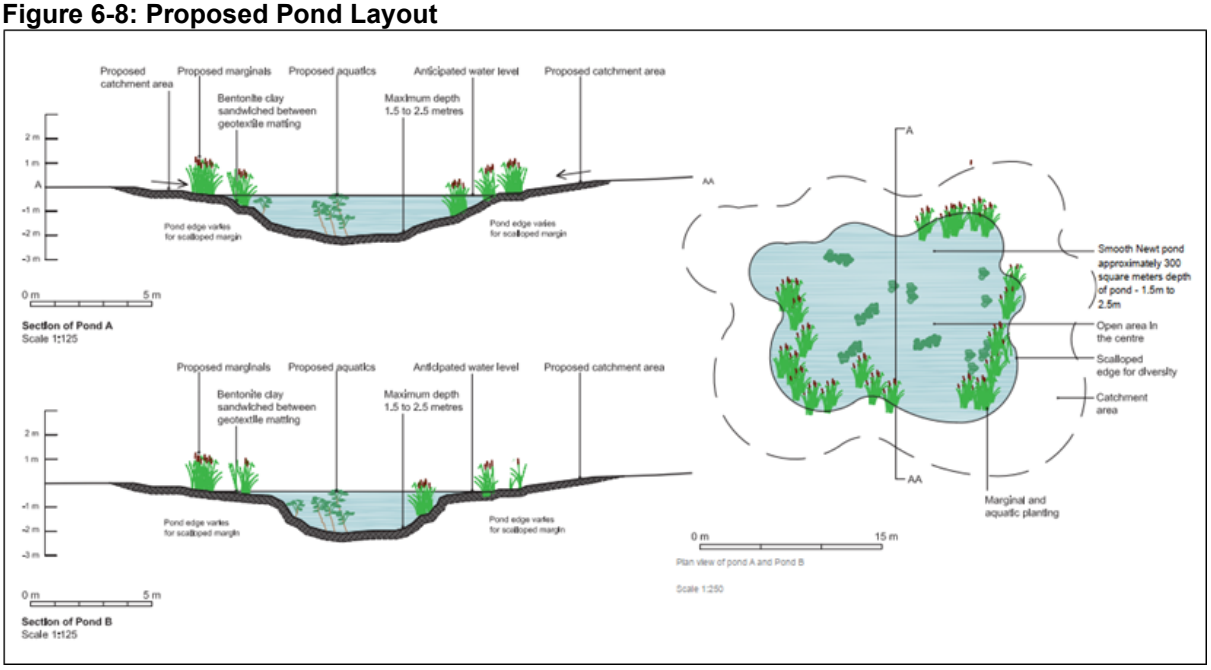
To ensure year-round water retention, each pond will be constructed with a clay lining or geotextile membrane, depending on underlying soil permeability.

Native emergent and marginal wetland vegetation, as outlined in Table 6-11 below, will be planted around and within the ponds. These plant species are vital for amphibian breeding, offering cover, spawning surfaces, and habitat for aquatic invertebrates, which serve as food sources.

In addition to the aquatic features, as part of the Restoration Plan, the areas of scrub, transitional vegetation, and recolonising bare ground across the site will be retained. These terrestrial habitats provide important shelter for amphibians during non-breeding periods, offering refuge from predators, excessive heat, and desiccation.

Refer to Figure 6-8 below for a conceptual layout of the proposed amphibian-friendly pond design.

Figure 6-8: Proposed Pond Layout



6.7.1.2 Aquatic and Marginal Planting

As part of the restoration plan, targeted planting of aquatic and marginal wetland vegetation will be undertaken around and within the newly constructed ponds.

This planting will accelerate the plant establishment process, stabilising pond margins and encourage the early colonisation of native species such as aquatic invertebrates, amphibians, and birds.

All new plant material will be sourced from reputable suppliers specialising in native Irish wetland species and local provenance stock.

Strict biosecurity measures will be implemented to prevent the unintentional introduction of non-native invasive species or aquatic fauna (e.g. fish). All plant material will be inspected prior to planting to ensure it is free of contaminants or unwanted biological material.

The planting strategy will vary according to the pond's design and liner type (clay or geotextile membrane), as follows:

Aquatic species will be planted either:

- In containerised baskets with aquatic soil, grouped in clusters of 5 to 8 individuals of the same species. The baskets will be submerged at a depth not exceeding 750 mm;
- Directly into pond substrate where suitable (e.g. in clay-lined areas), allowing for natural root establishment.

Marginal vegetation will be plug planted into shallow water zones and gently sloping pond edges. These will be:

- Planted in species-specific groups, with individual plugs spaced approximately 300 mm apart;

Positioned to create a graduated vegetative structure, offering a variety of microhabitats for different species and improving visual integration with the surrounding landscape. A recommended mix of native aquatic and marginal species will be used to reflect local wetland habitats and maximise biodiversity benefits as outlined in Table 6-11.

Table 6-11: Planting mix for Ponds and Marginal Mix for Banks

Common Name	Scientific Name
Acquatics	
Pond water crowfoot	*Ranunculus peltatus*
Pondweeds	*Potamogeton natans, or perfoliatus*
Common hornweed	*Ceratophyllum demersum*
Frog Bit	*Hydrocharis morus-rane*
Lesser Water Parsnip	*Berula eracta*
Water starwort	*Callitriche platycarpa*
Marginals	
Soft rush	*Juncus effusus*
Arrow-head	*Sagittaria sagittifolia*
Water mint	*Mentha aquatica*
Reed sweet-grass	*Glyceria maxima*
Branched bur-weed	*Sparganium erectum*
Meadowsweet	*Filipendula ulmaria*

Common Name	Scientific Name
Ragged robin	*Lychnis flos-cuculi*
Water forget-me-not	*Myosotis scorpioides*
Yellow flag-iris	*Iris psedudacorus*
Water plantain	*Alisma plantago-aquatica*
Marshmallow	*Althaea officinalis*

All planting activities will be supervised and guided by a suitably qualified ecologist, with final planting locations determined only after pond construction is complete.

This approach allows the ecologist to assess the site-specific conditions ensuring that vegetation is established in the most appropriate locations.

6.7.1.3 Proposed Wet Meadow

As part of the restoration plan, targeted planting will be undertaken around the outer margins of the newly constructed ponds, encompassing an area of ca. 2.6ha (ca. 26421.05 m²). Refer to Table 6-12 for potential species mix.

The seed mix will be locally sourced. Seeding will take place in either spring or autumn and will simply comprise broadcasting the seeds in an appropriate quantity within identified zone surrounding the ponds. Further soil spreading / penetration will occur as required. If site conditions are not immediately suitable, seeding will be postponed or adjusted to ensure successful establishment.

A qualified ecologist will assess site conditions and, based on this assessment, the most suitable native meadow/ wetland edge seed mix will be confirmed and sown, ensuring compatibility with local conditions.

Table 6-12: Proposed wet meadow mix

Common Name	Scientific Name
Grasses	
Marsh foxtail	*Alopecurus geniculatus*
Sweet vernal grass	*Anthoxanthum odoratum*
Tufted hair grass	*Deschampsia cespitosa*
Meadow fescue	*Festuca pratensis*
Red fescue	*Festuca rubra*
Rough meadow grass	*Poa trivialis*
Sedges	
Glaucous sedge	*Carex flacca*
Hairy sedge	*Carex hirta*
Sneezewort	*Achillea ptarmica*

Common Name	Scientific Name
Bugle	*Ajuga reptans*
Marsh marigold	*Caltha palustris*
Cuckooflower	*Cardamine pratensis*
Meadowsweet	*Flipendula ulmaria*
Square stalked St. John's wort	*Hypericum tetrapterum*
Autumn hawkbit	*Leontodon autumnalis*
Greater bird's foot trefoil	*Lotus pendunculatus*
Gypsywort	*Lycopus europaeus*
Ragged robin	*Lychnis flos-cuculi*
Common fleabane	*Pulicaria dysenterica*
Lesser spearwort	*Ranunculus flammula*
Creeping buttercup	*Ranunculus repens*
Great burnet	*Sanguisorba officinalis*
Marsh woundwort	*Stachys palustris*

6.7.1.4 Hibernacula and Habitat Piles

Hibernacula and habitat piles are a valuable habitat and support a range of biodiversity including insects, amphibians and small mammals. These habitats act as refuges and hibernation sites for amphibians as well as a host of other species of inverts and small mammals. The objective is to create a diversity of habitats within the Site.

Hibernacula and habitat piles can be created through the placement of either piles of rocks or logs around the margins of hedgerows / treelines, near wetland habitats and adjacent to drainage ditches. It is proposed to create these enhancement measures on-site. Refer to examples below, Plates 6-4 and 6-5

Plate 6-6: Typical Hibernaculum

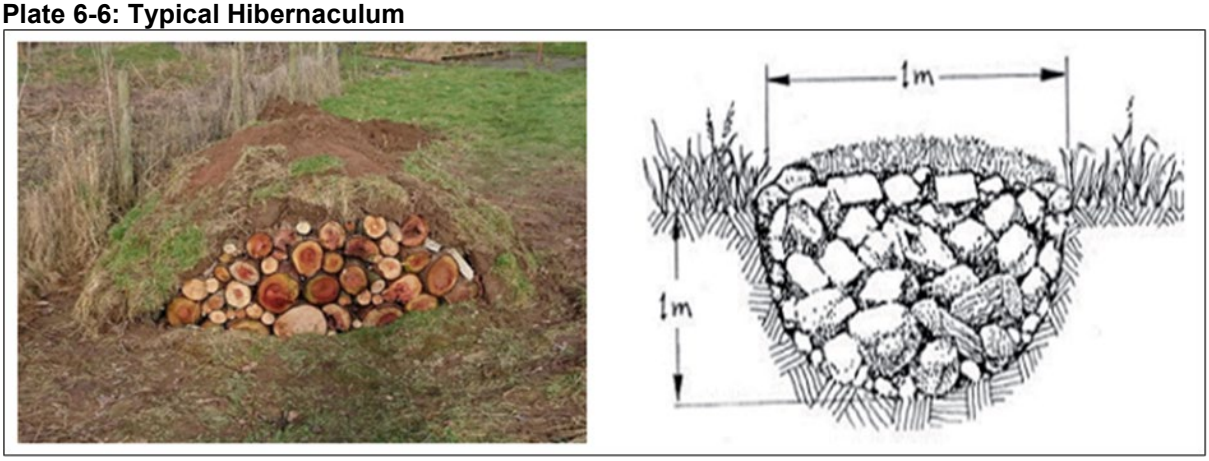


Plate 6-7: Habitat Piles

6.7.1.5 Proposed Woodland

As part of the Restoration Plan and biodiversity enhancement measures, ca. 6 ha (620m2) of new native woodland habitat is proposed within the southern section of the Site. Refer to Figure 6-9.

The proposed woodland creation is intended to contribute to long-term habitat diversity, connectivity, and species support on-site.

This habitat will also provide a source of food for a variety of species throughout the year by providing food resources, foraging, nesting and roosting habitats for a range of bird species, bat species, small mammals and invertebrates.

In addition to enhancing on-site biodiversity, the woodland will contribute to ecological connectivity between retained habitats and created wetlands, promoting movement corridors for wildlife.

The proposed woodland will be planted with the planting mix detailed in Table 6-13 below. Advanced nursery stock will be used as part of the planting mix. The planting will occur within the first available season (November to March). A minimum five-year establishment period will be observed, during which time trees will be monitored for health and growth. Any trees or shrubs that fail to establish within this period will be replaced during the following planting season with stock of similar species and size.

Natural succession processes will, in time, form a woodland understorey.

Table 6-13: Example of Woodland Mix

Common Name	Scientific Name
Woodland Trees (Upper and Lower Canopy)	
Pedunculate oak	*Quercus robur*
Scots pine	*Pinus sylvestris*
Beech	*Fagus sylvatica*
Ash	*Fraxinus excelsior*
Downy Birch	*Betula pubescens*
Holly	*Ilex Aquifolium*
Hawthorn	*Crataegus monogyna*

6.7.1.6 Hedgerow / Treeline

New hedgerow / treeline will be created along and wrapping the northeast corner of the Site. The boundary currently present in this section of the Site is a concrete fence.

Once mature this will result in a ca. 130m extension to the hedgerow linear feature along the eastern boundary of the Site.

All planting will consist of a mix of native species, of local providence and / or those that have a known attraction or benefit to local fauna, will provide shelter and a source of food for a variety of species throughout the year, including birds, small mammals, amphibians and pollinators. It will also allow movement of species such as badger and other small mammals and provide connectivity to the wider landscape.

The proposed native hedgerow mix is outlined in Table 6-14 below.

Table 6-14: Native Hedgerow Mix

Common Name	Scientific Name	% Mix
Hawthorn	*Crataegus monogyna*	*35%*
Blackthorn	*Prunus spinosa*	*25%*
Hazel	*Corylus avellana*	*20%*
Holly	*Ilex aquifolium*	*10%*
Pussy Willow	*Salix Caprea*	*10%*

6.7.1.7 Low Nutrient Habitat

As part of the Restoration Plan, a low nutrient habitat covering approximately 30 ha (306,500 m²) will be established within the quarry floor.

To encourage the development of calcareous grassland and pioneer communities, no topsoil will be spread or imported into this area. This approach is designed to maintain nutrient-poor conditions, which favour the establishment of specialist flora, including red hemp-nettle (*Galeopsis angustifolia*), a species of conservation interest. Any areas of scrub and existing ponds within this proposed area will also be retained.

The site will be allowed to undergo natural regeneration, with colonisation expected from the existing seedbank within the on-site substrate and through natural dispersal from surrounding habitats. Pioneer and early successional species are anticipated to dominate in the early stages, gradually giving way to more structured calcareous communities over time.

This habitat will be monitored regularly, with specific attention given to the potential establishment of red hemp-nettle. Should the species be recorded, a targeted management strategy will be implemented to support its conservation.

This low-nutrient habitat will significantly contribute to the biodiversity value of the restored quarry, providing conditions suitable for a range of specialist plant species and associated invertebrate fauna. Over time, this area is expected to develop into a species-rich, semi-natural grassland.

6.7.1.8 Steep Sided Slopes

Rock faces in quarries can serve as breeding sites for cliff-breeding bird species such as peregrine falcons. Given the potential for the cliffs on the eastern boundary to be used by this species, the upper quarry faces within this Quarry will be retained as part of the Restoration Plan. These benches will be allowed to erode naturally to enable the continual creation of bare and disturbed ground and will not be planted. See Figure 6-9 below.

6.7.1.9 Sand Martin Nesting Area

Sand Martins were identified foraging and nesting holes were identified within the proposed extraction land during the 2025 breeding bird surveys. Sand martins require steep or vertical slopes of fine sand. They will tunnel into sand even when it is being excavated, and may even tunnel in heaps of loose sand. Both males and females make a horizontal tunnel 45–90cm long with a chamber at the end.

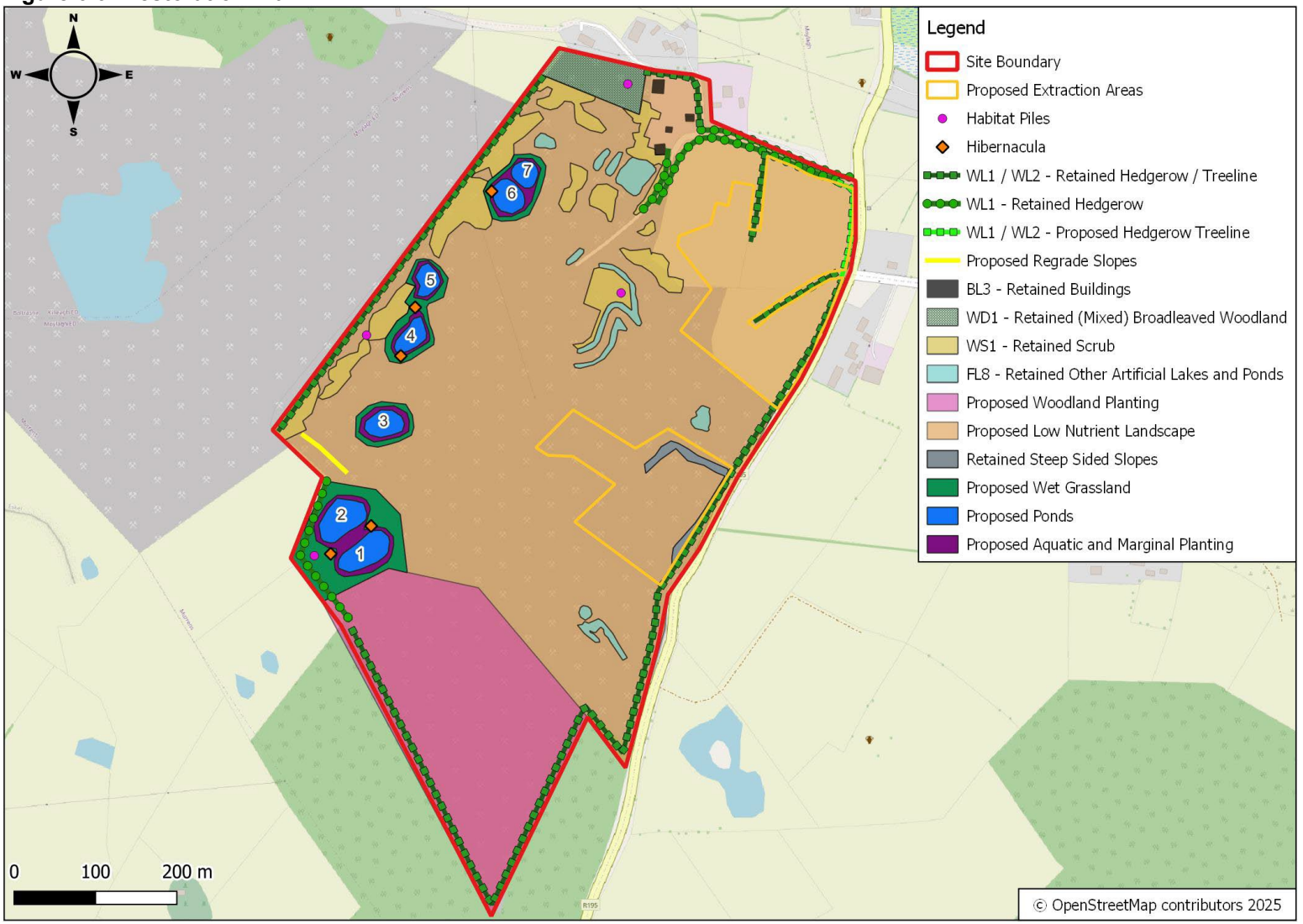
Suitable sites may be used for years. Sites are abandoned once the face slumps, becomes weathered (forming a resistant crust), overgrown with vegetation, or accessible to predators. New tunnels will be dug as the cliff collapses or as old holes become too big.

There are 6 sand martin nest hole locations onsite that will be lost due to the Proposed Development.

To compensate, it is proposed to regrade slopes along the southwest boundary of the Site to create a suitable sand martin nesting habitat. Refer to Figure 6-9 below for location.

These slopes will need to comprise ca. 3-5m of vertical slope to deter access of predators.

Figure 6-9: Restoration Plan



6.8 Unplanned Events

Should any protected or notable species colonise the Site during the life cycle of the project, there is a potential for these species to be impacted by the operations onsite. However, the taxa commonly associated with quarry environments have been considered as part of this assessment. Ongoing ecological monitoring throughout the life cycle of the Proposed Development will ensure that any protected or notable species will be identified and that appropriate mitigation / preventative actions can be taken.

6.9 Cumulative and In-combination Impacts

As described above, the Proposed Development works are unlikely to have a significant impact on valued ecological receptors onsite.

A review of the Meath County Council Planning ePlan website [17] did not identify any current granted plans or projects within the Site. However, there were two historic cases, detailed below:

- MCC Ref: 971223;
- Decision: Granted 08/12/1997;
- Description: ‘New entrance’;
- MCC Ref: 98967;
- Decision: Granted 09/12/1999; and,
- Description: ‘To construct an MV E.S.B. sub-station in existing quarry’.

A further historical case to the south of the Site is detailed below:

- MCC Ref: KA802993;
- Decision: Granted 18/09/2009;
- Expiration Date: 17/08/2014; and,
- Description: ‘An extension of the existing sand & gravel pit over an area of 4.4 hectares’.

In addition, the majority of nearby planning permissions are related primarily to one-off dwellings and light manufacturing (MCC Ref: 24315) [17] It is considered unlikely that the Proposed Development and these planning permissions would result in any in-combination effects on significant impacts on biodiversity, given the small-scale nature of the permissions granted. A planning application for a quarry extension was permitted directly to the south of the Site; further details are provided below:

MCC Ref: KA141129 & ABP Ref: PL.17.245257

- MCC Decision: Granted 07/07/2015;
- Expiration Date: 15/12/2036; and,
- Description: ‘The development will consist of: Extension of the existing sand & gravel pit (Quarry Ref: QY24) to include: an extraction area of c.23.9 hectares; perimeter landscaped screening berms; all other associated site works/ancillary activities; and restoration to a beneficial agricultural & ecological after-use within an overall planning application area of c.28.5 hectares. This planning application will be accompanied by an Environmental Impact Statement (‘EIS’). Significant further information/revised plans submitted on this application’.

The EIS submitted as part of this application concluded:

> *'At its closest point the application site lies immediately adjacent to parts of the Lough Naneagh pNHA and 225m north of White Lough, Ben Loughs and Lough Doo SAC however, no significant impacts from the proposed extension to the sand and gravel extraction operations are predicted on these designated sites with the potential zone of influence of the sand and gravel pit.*
>
> *The proposed extension of the Murrens will result in the direct loss of 28.5 acres of agricultural land over the lifetime of mineral extraction operations at this site. The majority of habitat that would be lost consists of agriculturally improved grassland of low ecological and conservation value, sections of low significance hedgerow and a number of ephemeral ponds, the loss of which is not predicted to be significant.*
>
> *Habitats of value that will be lost include sections of high significance hedgerow/treelines and five permanent ponds that are assessed as being of Local (higher) value. The residual impact of loss of these habitat would be significant over the medium to long-term but which can be reversed through the restoration of the site post-quarrying operations.*
>
> *A number of protected species have been confirmed within the application site, including the valued species of Smooth Newt that is assessed as being of 'County' value. However, through careful consideration of the potential impacts and the implementation of suitable mitigation to minimise these effects the extension of the sand and gravel extraction is not likely to have a significant impact on the local conservation status of these species. An amphibian mitigation strategy has been approved and a derogation licence issued by NPWS to Steve Judge of SLR Consulting Ireland (on behalf of BD Flood) for the implementation of these mitigation works.*
>
> *The restoration of the sand and gravel pit upon completion of the mineral extraction will restore the land back to agricultural and nature conservation purposes. In the long-term this would restore the site back to a value similar to that which currently exists. However, the restoration will also provide an opportunity to create habitat features that would have benefits for wildlife over the longer-term at this site.'*

As part of this application, a screening for Appropriate Assessment was also submitted and concluded that the proposed extension of quarrying operations was not likely to have any impacts on the Natura 2000 network.

This permission was appealed to ABP, and according to ABP's Inspectors Report, the Inspector concluded:

> '*Overall, it is reasonable to conclude that on the basis of the information on the file, which I consider adequate in order to issue a screening determination, that the proposed development, individually or in combination with other plans or projects would not be likely to have a significant effect on White Lough, Ben Loughs and Lough Doo SAC (Site Code: 001810), or any other European site, in view of the site's Conservation Objectives, and a Stage 2 Appropriate Assessment (and submission of a NIS) is not therefore required.'*

ABP granted this permission on the 16th December 2016.

The 'EIA' and 'AA' submitted as part of this application concluded that there would be no impacts on biodiversity. On the basis that it was concluded that this development would not result in any significant impacts on biodiversity and based on our assessment of the potential impacts associated with both the historical activities and the Proposed Development, which also concluded that there would be no significant impacts provided that the mitigation measures are followed, it can be concluded that there will be no in-combination impacts between these two Sites.

Furthermore, any potential cumulative effects will be minimised as all works will be completed in line with relevant best practice and legislation and mitigation measures detailed within the EIAR.

It is therefore considered unlikely that any significant cumulative and in combination effects will arise as a result of the Proposed Development. Subsequently, the cumulative effects on ecology arising from the Proposed Development in combination with other developments are considered to be imperceptible.

6.10 Interactions with other Environmental Attributes

The Environmental Attributes with which flora and fauna interact include:

- Chapter 7: Land and Soils; The alteration of soil conditions on-site through the removal of topsoil, subsoil and extraction of aggregate are key elements to the viability of this project. However, this change has the potential to impact biodiversity. Examples include mismanagement of the removal of stockpiles, importation of soil material into the Site (potential invasive species introduction) or contamination of soil. However, appropriate mitigation measures are proposed and outlined in detail in Chapter 7;
- Chapter 8: Water; Potential impacts on hydrology can also impact on ecological conditions. Mitigation measures for the prevention of groundwater and surface water contamination during all stages of the Proposed Development are outlined in detail in Chapter 8;
- Chapter 9: Air Quality and Climate; Air quality can potentially effect ecosystems; however, an assessment detailed in full in Chapter 9 demonstrated that the emissions to air from the Proposed Development will have no negative effects on ecosystems;
- Chapter 10: Climate; Climate change has the potential to effect ecosystems and biodiversity. However, due to the size and type of the Proposed Development, the influence of GHG emissions associated with the Proposed Development was shown to be imperceptible and full details of this conclusion are outlined in Chapter 10; and
- Chapter 11: Noise and Vibration; Noise can influence fauna through the disturbance of animals. Impacts on specifics have been outlined in Chapter 11 where relevant.

6.11 Residual Impacts

Based on the methodology set out in Section 6.2, the initial assessment of ecological receptors (Table 6-9) screened out the following habitats and species:

- Active Quarry and Mines (ED4);
- Buildings and Artificial Surfaces (BL3);
- Earth banks (BL2);
- Improved agricultural grassland (GA1)
- Recolonising Bare Ground (ED3);
- Mixed broadleaf woodland (WD1)
- Scrub (WS1);
- Badger;
- Bats; and,
- Protected Flora.

These ecological receptors were screened out from further assessment as the potential impacts were not considered to be significant, refer to Table 6-9 for further details.

In addition, an assessment of potential effects on Natura 2000 sites was undertaken and is presented in Stage One: Appropriate Assessment – AA, which forms part of the planning application. The conclusion of the AA found that the Proposed Development, either alone or in combination with other plans, projects or land uses, has not had and will not have any direct or indirect significant effects on any European sites in light of the site's conservation objectives and best scientific knowledge. No reasonable scientific doubt exists in relation to this conclusion. Accordingly, the progression to Stage 2 of the Appropriate Assessment process (i.e., preparation of a Natura Impact Statement) is not considered necessary. Therefore, Natura 2000 sites have been screened out from further consideration within this EIAR.

The following species and habitats outlined in Table 6-9 were identified as receptors that warranted further consideration to avoid impacts:

- Hedgerow / Treeline (WL1 / WL2);
- Other artificial lakes and ponds (FL8);
- Amphibians;
- Birds – Peregrine Falcon and Sand Martin;
- Invasive Species; and,
- Other fauna (terrestrial mammals).

Mitigation has been proposed for each of these ecological receptors alongside Restoration measures for the Site as outlined in Section 6.7. The results of these measures on these ecological receptors and the resulting residual impact are described below in Table 6-15.

Table 6-15: Valuation of Potential Ecological Receptors Post Mitigation and Enhancement

Receptor	Potential Impact	Assessment of Impacts Post Mitigation and Enhancement	Residual Impact
Hedgerow / Treeline	Disturbance to existing hedgerow / treeline	The commencement of the proposed extraction activities within close proximity of some of the existing hedgerow / treeline as part of the Proposed Development could result in disturbance to this habitat. Following the implementation of the proposed protection measures for this habitat, as outlined in Section 6.6.1, these retained hedgerow / treelines will be protected from disturbance / damage. In addition, following the implementation of the proposed Restoration Plan ca. 130m of new hedgerow / treeline will be created which, once mature, will connect to the existing linear features on the eastern boundary.	Slight Positive

Receptor	Potential Impact	Assessment of Impacts Post Mitigation and Enhancement	Residual Impact
Other artificial lakes and ponds.	Net loss of Habitat Stockpile Removal	It is considered that following the implementation of the mitigation and restoration measures, which includes the creation of seven new ponds the potential impacts on this receptor will be slightly positive, and as such, there will be no residual impacts as a result of the Proposed Development. The seven new ponds will be created in the west and southwest section of the Site as part of the preparation works in advance of closure of ponds within the proposed new extraction areas. Following cessation of quarry activities at the Site, the remaining ponds on the Site will be retained and allowed to naturalise and form part of the network of ponds / wetland across the Site. In addition, monitoring and inspection of the Site by the 'ECoW', in advance of any removal of stockpiles (as outlined in Section 6-12) will be undertaken.	Slight positive
Amphibians	Habitat Loss / Disturbance	It is considered that following the implementation of the remedial / restoration measures, the potential impacts on this receptor will be slightly positive, and as such there will be no residual impacts as a result of the Proposed Development. Measures include the creation of seven new ponds within the west and southwest area of the Site, as part of the preparation works in advance of closure of ponds within the proposed new extraction areas. Following cessation of quarry activities at the Site, the remaining ponds on the Site will be retained and allowed to naturalise and form part of the network of ponds / wetland across the Site.	Slight positive
Birds	Habitat Loss	It is considered that following the implementation of the remedial / restoration measures, which includes the planting ca. 6ha of native woodland, the creation of new hedgerow, the creation of seven new ponds / wetland and specific measures with regard to peregrine falcon and sand martin (see Sections 6.6.2 and 6.6.3) potential impacts on this receptor will be imperceptible. In addition the creation of habitats included in the Restoration Plan will benefit specifically peregrine falcon and sand martins but also birds in general within the local area. As such there will be no residual impacts as a result of Proposed Development.	Imperceptible
Terrestrial Mammals	Disturbance, loss of foraging / commuting habitat.	It is considered that following the implementation of the mitigation and restoration measures, which includes the planting ca. 6ha of native woodland as well as the creation of other habitats onsite,	Imperceptible

Receptor	Potential Impact	Assessment of Impacts Post Mitigation and Enhancement	Residual Impact
		that the potential impacts on this receptor will be imperceptible, and as such there will be no residual impacts as a result of the Proposed Development. See Sections 6.6.5 and 6.7.	
Invasive Species	Introduction and spread of invasive species.	Provided the mitigation outlined in Section 6.6.6 is followed, it is considered that no impacts will occur to valued ecological receptors as a result of the spread or introduction of invasive species.	Imperceptible

Taking into account the mitigation measures and proposed restoration measures for the Site, it is considered that the construction and operational phase onsite will have an imperceptible residual impact.

In the longer-term, following the successful implementation of the Restoration Plan, it is considered that the proposed project has the potential to have a slight positive effect on ecology.

6.12 Monitoring

An ECoW will be appointed to the project to oversee compliance with the required ecological mitigation and remedial / biodiversity enhancement measurements.

- The ECoW will inspect the Site and undertake a botanical survey within the optimum survey season in advance of the removal of the stockpile to check for the presence of protected or notable species. Should protected or notable species be identified, the project 'ECoW' will consult with the NPWS;
- The ECoW will provide support throughout the life cycle of the newt mitigation works to ensure that they are completed in a manner that best achieves the plan's aims and ensures the protection of amphibians using the Site;
    - The new ponds will be subject to monitoring in years 1, 3 and 5, following the creation of the new ponds. The monitoring will confirm that the conditions on the ponds are suitable for breeding amphibians and assess the success of the planting and habitat creation works. The survey will also confirm if amphibians are using these newly created waterbodies; and,
    - Annual monitoring reports will be prepared and submitted to the Meath County Council detailing the progress of the plan.
- Peregrine falcon Surveys and Sand martin surveys will be undertaken by the ECoW for the next five years to monitor for the presences of the species and to ensure no impacts occur to breeding birds as a result of the Proposed Development, the findings of the monitoring will be submitted to Meath County Council and the National Biodiversity Records Centre.

6.13 Reinstatement

As outlined above reinstatement and restoration works will be implemented from Stage 1 of the Proposed Development – Site Preparation. The Site will continue to be subject to a Restoration Plan following the cessation of operations onsite with further details included in Section 6.7.

6.14 Do Nothing Scenario

Given the quality of the onsite habitats, whereby the dominant habitat is quarry and active mine it is considered that the implementation of Restoration phase of the Proposed Development will provide a better outcome than the do nothing scenario. The resultant mosaic of habitats will provide increased and enhanced habitat and opportunities for a variety of wildlife.

6.15 Difficulties Encountered

No difficulties were encountered in undertaking this assessment.

It is considered that the finding of the above assessment will remain valid for a period of two years, providing that the Site conditions remain broadly unchanged.

It should be noted that a Sites biodiversity value and use by protected or notable species can alter over time. For this reason, updated surveys have been included as part of the mitigation works to ensure that Site conditions remain unchanged and ensure that the Proposed Development will not have any significant effects on Biodiversity.

6.16 References

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7 LAND, SOILS & GEOLOGY

7.1 Introduction

This chapter of the EIAR has been prepared by the MOR Environmental team. It provides a description and assessment of the potential, likely, and significant impacts (if any) on the geological and soil environment which can reasonably be expected to occur because of the Proposed Development and subsequent restoration. Where likely significant effects were identified, appropriate remedial measures to reduce or avoid these effects have been outlined.

7.2 Methodology

The study area for the Land, Soils and Geology assessment has been defined on the basis of a 2 km radius from the Site, as suggested in the Institute of Geologists of Ireland ('IGI') Guidelines [1]. In line with these guidelines and in line with a review of the land, soils and geological environment, the study area may be extended beyond the 2 km radius to reflect the sensitivity of the subsurface and the presence of sensitive features which may be impacted by the Site.

In order to determine the baseline environment, a desk-based study was undertaken to collect and review background information, a site walkover was carried out and site-specific site investigations were undertaken.

7.2.1 Legislative Context

The importance and sensitivity of the geological receptors within the Site were assessed on completion of the desk study as set out in Table 3-4 of the EPA's 'Guidelines on the Information to be contained in Environmental Impact Assessment Reports'. The Guidelines are formally adopted and published by the EPA [2].

In addition to the EPA Guidelines, the assessment was carried out in accordance with the following guidance and tailored accordingly based on professional judgment:

- IGI Guidelines for Preparation of Soils, Geology & Hydrogeology Chapters in Environmental Impact Statements [1];
- National Roads Authority (2008): Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes [3];
- Department of Environment, Heritage and Local Government: Quarries and Ancillary Activities - Guidance for Planning Authorities [4];
- EPA Environmental Management in the Extractive Industry (Non-Scheduled Minerals) [5]; and,
- IEMA Guide: A New Perspective on Land and Soil in Environmental Impact Assessment [6].

7.2.2 Desk Study

A desk study of the Site and surrounding area was conducted using available geological information held by the Geological Survey of Ireland ('GSI') for the general area and any available site-specific information, including the findings from onsite drilling of boreholes. The following sources were reviewed for this purpose:

- Geological Survey of Ireland ('GSI') Public Data Viewer [7];
- Environmental Protection Agency ('EPA') Online Mapping [8];
- J.M. Leigh Surveys Ltd. Geophysical Survey Report for Murrens Quarry [9];

- SixWest Topographic Survey [10];
- GSI Meath – County Geological Report for Murrens [11]; and,
- Causeway Geotech Murrens Quarry, Oldcastle, Ground Investigation Report [12].

A site visit was carried out by MOR Environmental personnel on 27th November 2024. The purpose of the site visit was to liaise with the site operator and undertake a site walkover to gain an understanding of the site operations, identify potential areas of concern and assess the potential effect of quarrying activities on the geological environment.

The findings of the desk-based study are presented in Section 7.3.4 and the findings of the site visit are presented in Section 7.3.5.

7.2.3 Site Investigations

Intrusive and non-intrusive site investigations were undertaken to characterise the geological environment of the Proposed Development. The investigations included the following:

- A topographical site survey was undertaken in order to survey the area to Ordnance Datum [10];
- A geophysical survey was undertaken in order to survey magnetic anomalies at the Quarry Site [9];
- Installation of three groundwater wells (BH01, BH02 and BH03) at the Quarry Site in January 2025. Wells range from 10 to 20mbgl [12];
- Trial pits were excavated by Causeway Geotech at six locations (TP01-TP06) in January 2025 in the northeastern section of the Site. Trial pits range from 2.5 to 4.6mbgl [12];
- Soil sampling and analysis was carried out at the Site at TP01-TP06 in January 2025. 12 samples were collected and analysed for a range of parameters to determine the quality of soils at the Site [12].

The findings of the intrusive site investigation carried out by Causeway Geotech is presented in Section 7.3.5.

7.2.3.1 Topographic Survey

SixWest conducted a topographic survey in December 2024 [10] to collect accurate information on the landscape features within the Site. Deliverables from the survey included an ortho map, the elevation of various features and detailed satellite images of the specific areas of the Site. Details for the findings of the topographic investigation are further discussed in Section 7.3.3. The topographic survey is presented within the planning drawings, refer to Drawing No. MM250507-04 ‘Existing Site Layout’.

7.2.3.2 Geophysical survey

A detailed gradiometer geophysical survey was conducted by J.M. Leigh Surveys Ltd. on 21st January 2025 [9] to detect subtle variations in the magnetic field within a ca. 1.02ha area of rough pasture within the north of the Site. The aim of the survey was to identify any geophysical responses that may represent the remains of unknown archaeological features within the application area. Results of the survey showed faint linear trends which may be representative of a former trackway, ploughing activity and a former field boundary or division. Isolated responses are noted within the data which may be of archaeological interest, but interpretation is cautious.

Further information is presented in Chapter 13 Cultural Heritage of this EIAR, and the accompanying geophysical report is presented in Appendix 13-3.

7.2.3.3 Monitoring Well Drilling

An intrusive site investigation was undertaken to characterise the geological and hydrogeological environment between 13th and 15th January 2025 [12]. Three new groundwater monitoring wells (BH01, BH02 and BH03) were installed within the quarry Site, refer to Figure 7-8. Causeway Geotech was subcontracted to drill the wells while an experienced MOR Environmental geologist supervised the works.

The monitoring wells were installed at depths ranging from 10mbgl (BH03) to 20mbgl (BH02) using a rotary core drilling rig. During the installation works the MOR Environmental geologist noted changes in the lithological profile and evidence of water present within the strata layers. Each groundwater monitoring well was logged in accordance with best practise procedures, and visual and olfactory observations were also recorded.

The borehole logs for these wells include details of how the wells were completed and the groundwater monitoring installation in each. These records provide insight into the geology underlying the Site. Details of the investigation relating to the geological environment are presented in Section 7.3.5. The Causeway Geotech investigation report is presented in Appendix 7-1.

7.2.3.4 Soil Investigations

Causeway Geotech carried out an intrusive site investigation on 23rd January 2025 [12] to collect information on the underlying geology of the site to inform the site-specific geological setting and determine if the Site has had any lasting negative effects on the soils and geology environment. Details of the investigation findings are presented in Section 7.3.5 and the investigation report is presented in Appendix 7-1. The site investigation programme carried out by Causeway Geotech involved the excavation of six trial pits in the north of the Site. Refer to Figure 7-7 for the trial pit locations.

7.2.4 Impact Assessment Methodology

Following on from the identification of the baseline environment, the available data was utilised to identify and categorise potential effects on the land, soils and geological environment as a result of the Proposed Development.

The significance of effects due to the Proposed Development has been assessed in accordance with the EPA guidance document Guidelines on the Information to be Contained in Environmental Impact Assessment Reports [2]. These are outlined in Chapter 1 (Introduction) of this EIAR and are dependent on the sensitivity of the environmental attributes and the magnitude of the impact.

The sensitivity of the land, soils and geological environment was assessed on completion of the desk study. Using the table presented in Box 4.1 of the 2008 NRA Guidelines [3], which is also presented in Appendix C of the IGI Guidelines [1], the sensitivity of the soils and geological attributes within the study area is set out in Table 7-1 below.

The magnitude of the impact takes into account the likely scale of the predicted change to the baseline conditions and considers the duration of the impact i.e. temporary or permanent. The criteria for determining the magnitude of the impact on the land, soils and geological environment is based on the table presented in Box 5.1 of the 2008 NRA Guidelines [3], which is also presented in Appendix C of the IGI Guidelines [1], is presented in Table 7-2 below.

Potential impacts may have a negative, neutral or positive effect on the land, soils and geological environment.

Table 7-1: Sensitivity of Geological Attributes

Importance	Criteria	Typical Example
Very High	Attribute has a high quality, significance or value on a regional or national scale. Degree or extent of soil contamination is significant on a national or regional scale. Volume of peat and / or soft organic soil underlying route is significant on a national or regional scale.	Geological feature rare on a regional or national scale (NHA). Large existing quarry or pit. Proven economically extractable mineral resource.
High	Attribute has a high quality, significance or value on a local scale. Degree or extent of soil contamination is significant on a local scale. Volume of peat and / or soft organic soil underlying site is significant on a local scale.	Contaminated soil on site with previous heavy industrial usage. Large recent landfill site for mixed wastes. Geologically feature of high value on a local scale (County Geological Site). Well drained and / or high fertility soils. Moderately sized existing quarry or pit. Marginally economic extractable mineral resource.
Medium	Attribute has a medium quality, significance or value on a local scale. Degree or extent of soil contamination is moderate on a local scale. Volume of peat and / or soft organic soil underlying site is moderate on a local scale.	Contaminated soil on site with previous light industrial usage. Small recent landfill site for mixed wastes. Moderately drained and / or moderate fertility soils. Small existing quarry or pit. Sub-economic extractable mineral resource.
Low	Attribute has a low quality, significance or value on a local scale. Degree or extent of soil contamination is minor on a local scale. Volume of peat and / or soft organic soil underlying site is small on a local scale.	Large historical and / or recent site for construction and demolition wastes. Small historical and / or recent site for construction and demolition wastes. Poorly drained and / or low fertility soils. Uneconomically extractable mineral resource.

Table 7-2: Magnitude of Impact on Geological Attributes

Magnitude	Criteria	Typical Example
Large adverse	Results in a loss of attribute.	Loss of high proportion of future quarry or pit reserves. Irreversible loss of high proportion of local high fertility soils. Removal of entirety of geological heritage feature.

Magnitude	Criteria	Typical Example
		Requirement to excavate / remediate entire waste site. Requirement to excavate and replace high proportion of peat, organic soils and/or soft mineral soils beneath the development.
Moderate adverse	Results in impact on integrity of attribute or loss of part of attribute.	Loss of moderate proportion of future quarry or pit reserves. Removal of part of geological heritage feature. Irreversible loss of moderate proportion of local high fertility soils. Requirement to excavate / remediate significant proportion of waste site. Requirement to excavate and replace moderate proportion of peat, organic soils and/ or soft mineral soils beneath the development.
Small adverse	Results in minor impact on integrity of attribute or loss of small part of attribute.	Loss of small proportion of future quarry or pit reserves. Removal of small part of geological heritage feature. Irreversible loss of small proportion of local high fertility soils and/or high proportion of local low fertility soils. Requirement to excavate / remediate small proportion of waste site. Requirement to excavate and replace small proportion of peat, organic soils and/or soft mineral soils beneath the development.
Negligible	Results in an impact on attribute but of insufficient magnitude to affect either use or integrity.	No measurable changes in attributes.
Minor beneficial	Results in minor improvement of attribute quality.	Minor enhancement of geological heritage feature.
Moderate beneficial	Results in moderate improvement of attribute quality.	Moderate enhancement of geological heritage feature.
Major beneficial	Results in major improvement of attribute quality.	Major enhancement of geological heritage feature.

Once the importance and sensitivity of the geological attributes are established, the conventional source-pathway-receptor model was applied to assess potential effects on groundwater and surface water from the Proposed Development.

Source

A potential source of impact relates to items or features which have the potential to have an effect on the environment. For example, contaminants such as hydrocarbons, which may leak from vehicles or storage tanks.

Pathway

A pathway is an exposure route that the source of impact can take to reach an environmental attribute and impact that attribute. For example, contaminants such as hydrocarbons may be able to infiltrate into the ground.

Receptor

A receptor is an environmental attribute that may be impacted should a pathway be available to connect it to a source of impact. For example, the soils underneath the site may be considered a receptor that is impacted by hydrocarbons infiltrating into them due to a leakage in a storage tank.

In instances where a Source-Pathway-Receptor ('SPR') linkage has been established, the impact assessment matrix table presented in Box 5.4 of the 2008 NRA Guidelines [3] and in Appendix C of the IGI Guidelines [1], and presented in Table 7-3 below, provides a framework for the consistent and transparent assessment of predicted effects across all technical chapters. However, individual assessments are based on relevant guidance and the application of professional judgement.

In taking the sensitivity of the geological attribute and the magnitude of the impact, the significance of the effect is assessed. For the purpose of this assessment, effects rated as being "Significant-Moderate" or above are considered to be significant in EIA terms. Effects rated as being "Moderate" are subject to professional judgement regarding significance, with a rationale provided for this in the main assessment. Effects identified as less than moderate significance are not considered to be significant in EIA terms.

Table 7-3: Impact Assessment Matrix

Sensitivity of Receptor	Magnitude of Impact			
	High Adverse	**Medium Adverse**	**Small Adverse**	**Negligible**
Very High	Profound	Profound/ Significant	Significant / Moderate	Not Significant
High	Profound / Significant	Significant/ Moderate	Slight / Not Significant	Imperceptible
Medium	Significant	Moderate	Slight	Imperceptible
Low	Moderate / Slight	Slight/ Not Significant	Not Significant	Imperceptible

7.3 Receiving Environment

7.3.1 Historical Land Use

A review of the Tailte Eireann historical maps and the historical aerial photography available for viewing as basemaps on the GSI open data viewer [7], was carried out to assess the changes in land use. The historical maps include the first edition 6-inch map dated 1829 – 1841, the first edition 25-inch map dated 1897 to 1913, and the last edition 6-inch series dated 1830s to 1930s. The aerial photography includes photos dated 1995, 1996 - 2000, 2001 – 2005, 2006 – 2012, and 2013 – 2018.

The first edition 6-inch map identifies the Site area as undeveloped but with two structures of unknown use in the northern part of the Site and one structure of unknown use along the eastern Site boundary. Several historical gravel pits are mapped in the immediate area surrounding the Site.

The first edition 25-inch map identifies two lime kilns and a structure of unknown use, but denoted as P, in the northern part of the Site. These structures have since been removed. The structure mapped along the eastern site boundary in the first edition 6-inch map is not present in the first edition 25-inch map. The land is indicated to be predominantly dry with a small area of potential marsh in the north of the site and a larger area in the centre of the site. A possible water body is mapped in the centre of the site within this larger marshy area. The gravel pits mapped in the first edition 6-inch map are not present in the first edition 25-inch map; however, one additional gravel pit is mapped to the northeast of the Site.

The last edition 6-inch map presents similar information on the Site and surrounding land as that shown in the first edition 25-inch map. The possible water body in the centre of the site is identified as 'water' on the last edition of the 6-inch map.

The recorded history of the quarry recognises the Site as having pre-1995 origins.

Black and white aerial photography from 1995 shows that extraction has taken place within the central and northern areas of the Site and that the surrounding land is undeveloped. The extension of the quarry to the western site boundary is shown in the 1996 – 2000 aerial photography, and the water system on the site appears to be in development at this time. The 2001 – 2005 and 2006 – 2012 aerial photography shows the extension of the quarry towards the east and south of the Site, and the quarry extents are to the eastern and southern site boundaries are shown in the 2013 – 2018 aerial photography. Since then, the quarry has been extended to the north, as observed during site walkovers.

This review of the historical maps and aerial photography indicates that the land surrounding the Site has been used for gravel extraction as far back as the early to mid-1800s. The main changes in land use to the land surrounding the Site are the development of the neighbouring quarry to the west, the construction of the local road network, and the development of one-off residential housing.

Overall, the surrounding land to the north, east and south of the Site has remained predominantly unchanged.

7.3.2 Current Land Use and Site Description

According to the Corine Land Cover mapping presented on EPA Maps [8], the current land use for the majority of the Site and to the west of the Site is characterised as a 'mineral extraction site'. This corresponds with the Site quarry and neighbouring quarry extraction activities. The northern area of the Site and the surrounding land to the north of the Site is classified as 'land principally occupied by agriculture with significant areas of natural vegetation'. The surrounding land to the east and south of the Site is classified as agricultural areas used for 'pasture'.

There are various land uses within the 2km study area, with most land use identified as forested or agricultural. Refer to Figure 7-1 below.

Inland marshes are identified ca. 1.9km south of the Site and, according to the nomenclature guide provided by the European Topic Centre on Urban Land and Soil Systems [13], consist of low-lying land usually flooded in winter, and with ground more or less saturated by fresh water all year round.

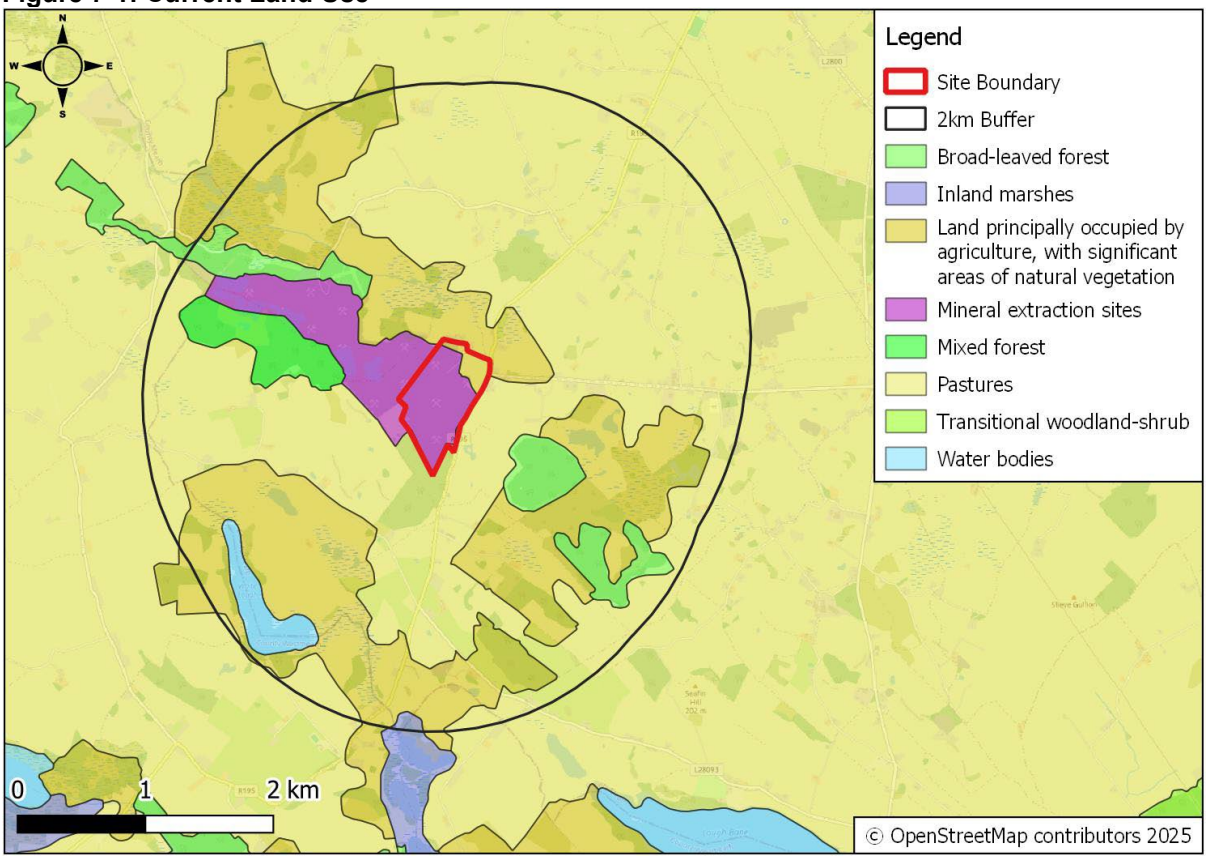
Directly ca. 0.72km to the northwest, and ca. 0.42km and ca. 1.1km to the southeast of the Site respectively, the area is dominated by 'broad-leaved forests. These areas are characterised by trees with a minimum height of 5m, and include deciduous and evergreen broad-leaved tree species coving >75% of the tree covered area; sporadically occurring patches of coniferous trees not exceeding 25% of the tree covered area and sporadically occurring <25ha patches of shrubs, herbaceous vegetation, mosses and lichens, and denuded spots underneath [13].

Directly ca. 0.45km east of the Site, the area is dominated by 'mixed forests'. These areas are characterised by trees including shrubs and bush understory where neither broad-leaved nor coniferous species pre-dominate. These areas consist of deciduous and coniferous trees with 25-75% share, evergreen or deciduous coniferous (needle-leaved) trees with 25-75% share and randomly occurring <25ha patches of shrubs, herbaceous vegetation, mosses and lichens, and/or denuded spots underneath [13].

Areas of 'land principally occupied by agriculture with significant areas of natural vegetation' are present to the north of the Site, ca. 0.6km east of the Site and ca. 0.6km southwest of the Site are characterised by areas principally occupied by agriculture, interspersed with significant natural or semi-natural areas (including forests, shrubs, wetlands, water bodies, mineral outcrops) in a mosaic pattern. The remaining land use within the 2km study area identified as 'pasture' consists of lands that are permanently used (at least 5 years) for fodder production. These lands can be extensively or intensively grazed permanent grasslands with the presence of farm infrastructure such as fences, shelters, enclosures, watering places, drinking trough, and/or regular agricultural measures and works such as mowing, drainage, hay making, seeding, manuring and shrub clearance [13].

The surrounding area also comprises a number of individual private dwellings and farms; small businesses, local roads and the R195 regional road from which the Site is accessed.

Figure 7-1: Current Land Use



7.3.3 Topography

Based on the topographic contour data available on the GSI public data viewer [7], the Site is located in a hummocky landscape, with higher topography generally to the south and southeast and softly undulating landscape to the north. Greenan hill and Ballany hill to the southeast are topographic highs of 209 mOD and 197 mOD respectively.

7.3.4 Regional Environmental Setting

7.3.4.1 Soils

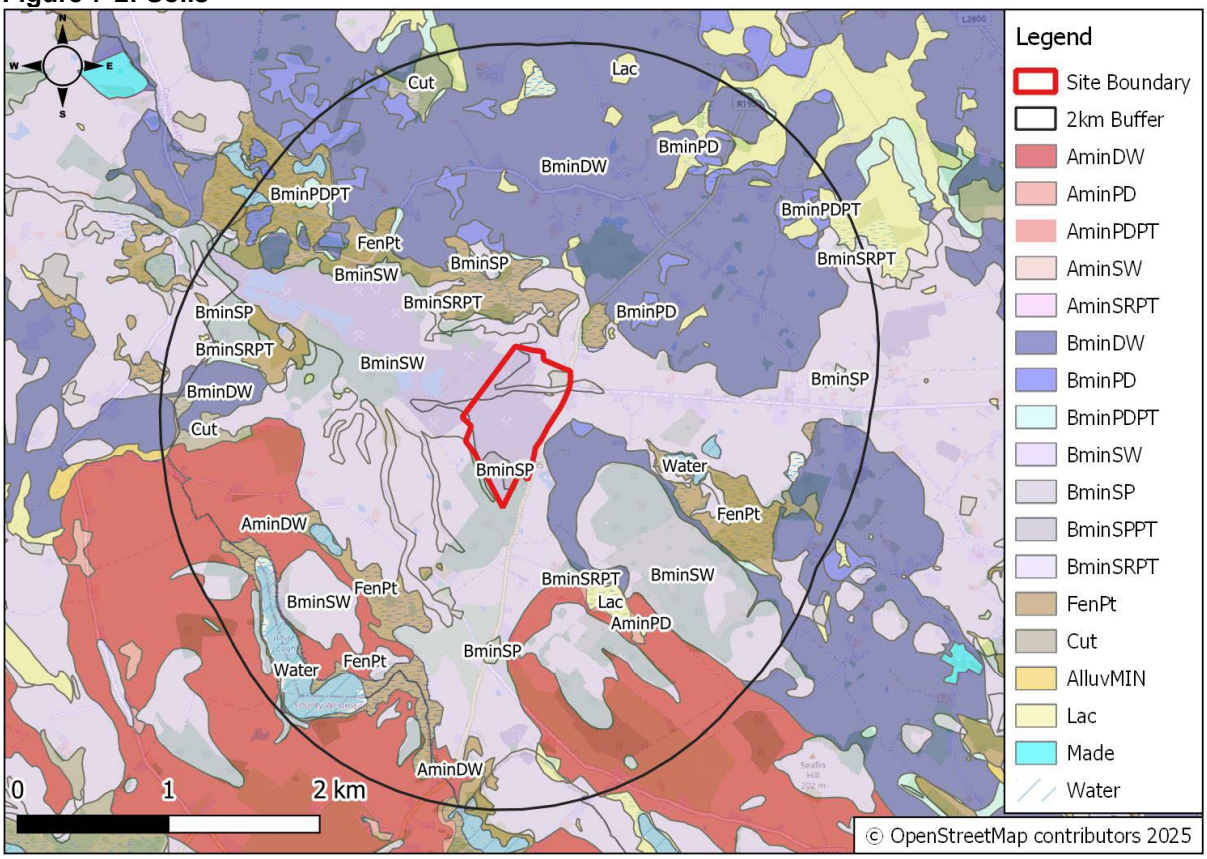
According to the GSI database soil map [7], the Site is characterised by soils of basic, shallow, well drained minerals ('BminSW') throughout the majority of the Site. Small areas in the northeast and southeast areas of the Site care characterised by basic, shallow, poorly drained minerals ('BminSP').

In addition to the above soil types, the surrounding study area comprises gravels and tills derived from limestone (basic minerals), till chiefly derived from cherts (acidic minerals), peaty deposits and alluvium along riverbanks and lacustrine deposits. These soils are categorised into the following soil types and presented in Figure 7-2 below:

- Mainly basic, deep, well drained minerals ('BminDW') throughout the study area;
- Mainly basic, poorly drained minerals ('BminPD') predominantly in the north of the study area;
- Mainly basic, shallow, peaty/non-peaty minerals ('BminSRPT');
- Mainly acidic, deep, well drained minerals ('AminDW');
- Mainly acidic, poorly drained minerals ('AminPD');
- Patches of lacustrine ('Lac') and alluvium ('AlluvMIN');
- Patches of peaty soils throughout the study area, which include:
    - Blanket peat ('BkPt');
    - Fen peat ('FenPt');
    - Cutover / cutaway peat ('Cut');
    - Mainly basic, peaty, poorly drained minerals ('BminPDPT');
    - Mainly basic, shallow, rocky, peaty/ non-peaty minerals ('BminSRPT'); and,
    - Mainly acidic, peaty, poorly drained minerals ('AminPDPT') are identified only in the southeast of the study area.

Soils in the study area directly correlate to quaternary geology (i.e. subsoils) discussed in section 7.3.4.2.

Figure 7-2: Soils



7.3.4.2 Quaternary Geology

Quaternary sediments are soft materials that have been deposited over the last 2.6 million years and in Ireland, much of this is glacial sediment deposits. These deposits make up the subsoils across the country.

According to the GSI mapping [7], quaternary sediments (subsoils) within the majority of the Site are characterised by gravels derived from limestones ('GLs') as shown in Figure 7-3 below. Two long bands of an esker comprised of gravels of basic reaction ('BasEsk') cut through the northern area and southern area of the Site, orientated east to west and northwest to southeast respectively. Eskers comprised of gravels of basic reaction are long and narrow ridges of glacio-fluvial materials deposited at the base of an ice sheet during the last ice age. Hence, the orientation of these eskers corresponds with the direction of travel of these paleo ice sheets. The northwestern boundary of the Site is dominated by the esker. The GSI mapping also shows gravels derived from Limestones throughout the Site, and a small section of lacustrine sediments ('L') recorded in the northeastern section of the Site, bordering the northern esker band. These gravel deposits and eskers are described in more detail in section 7.3.6. Lacustrine subsoils comprised well-sorted, laminated beds of silts and clays deposited in low-energy lacustrine environments, corresponding to possible glacial lakes associated with the eskers and paleo-glacial activity in the study area.

In addition to gravel deposits and esker, the main subsoils are till derived from limestones ('TLs') to the east, north and west of the study area; and till derived from chert ('TCh') in the south of the study area.

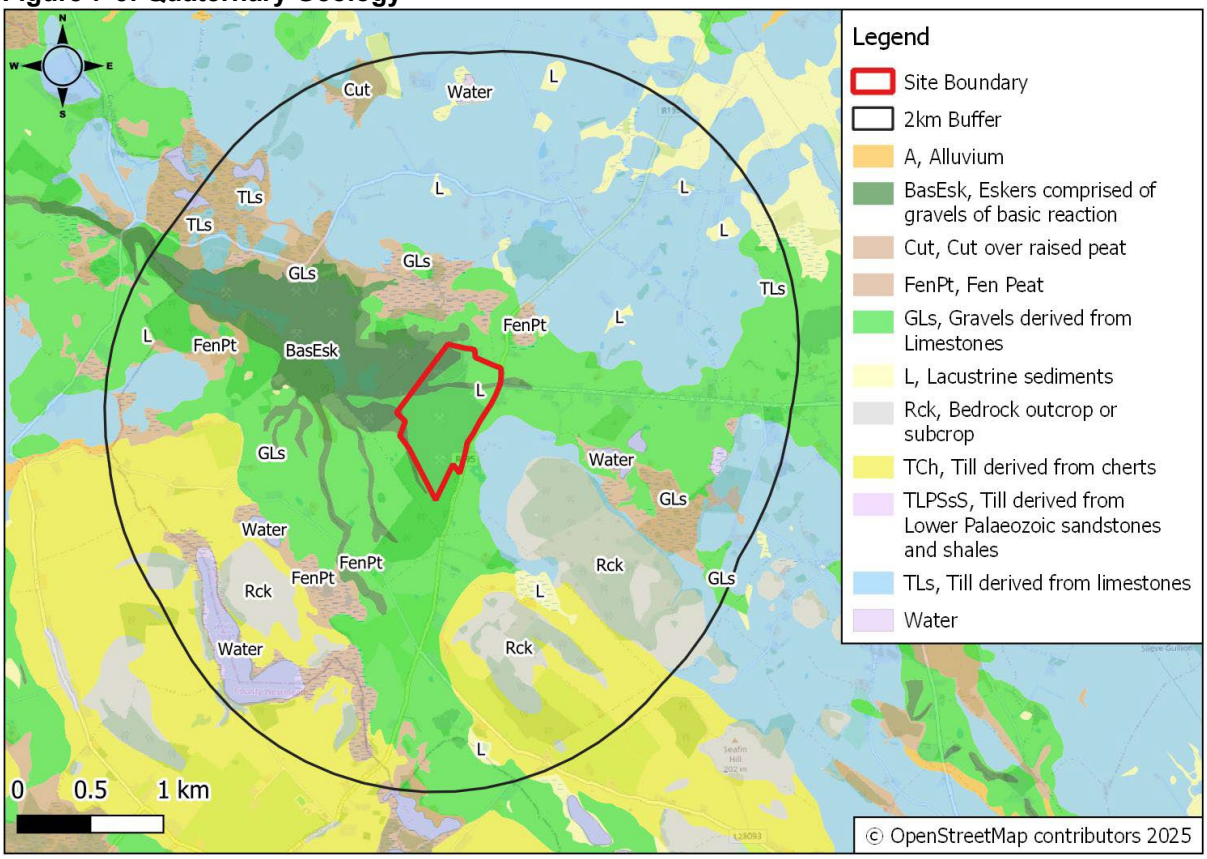
Isolated areas of Fen peat ('FenPt') and cutover peat ('Cut') are present throughout the study area and correspond with the location of areas of peaty soils. Fen peat is described as peatland situated within a depression that has been in contact with bedrock or soils rich with minerals, often basic, corresponding to limestone geology within the area.

There are several lacustrine sediment deposits across the study area and there are areas of bedrock outcrop or subcrop ('Rck') in the south of the study area.

The subsoil permeability varies across the study area. It is classified as high where there are gravel and fluvio-glacial deposits, low where there are peat deposits and moderate elsewhere. Areas which do not have a classification correspond to areas where the subsoil is less than three meters thick. These areas correspond to the mapped areas of bedrock outcrop of subcrop.

Subsoil permeability assessed with subsoil depth provides an indication of how well-protected the groundwater is and how vulnerable the groundwater is to pollution. Additional information on this is provided in Chapter 8 – Water.

Figure 7-3: Quaternary Geology



7.3.4.3 Glacial Landforms

The Site is located within a hummocky landscape defined by glacial landforms, including a series of esker ridges known as the Finnea-Murrens Esker, the Murrens Supraglacial Delta within which the Site is located, and the Drumone Fan. Other glacial landforms include drumlins and moraines, as well as features cut into the bedrock which indicate the direction of travel of the ice sheet, such as crag and tail and streamlined bedrock.

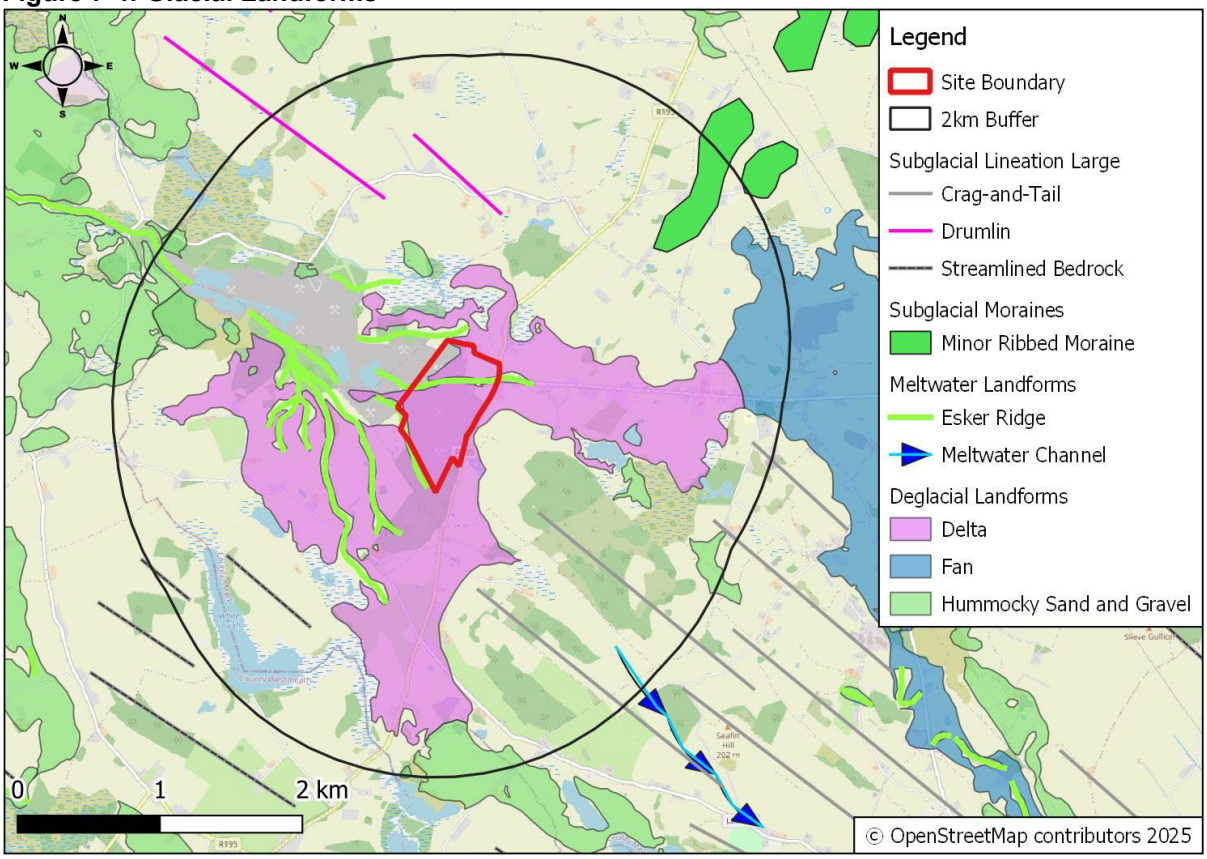
Eskers are features relating to streams that form beneath ice sheets, bounded by ice walls in the form of tunnels, allowing fluvial coarse-grained sediments to be deposited during deglaciation. Drumlins are elongated hills in a general teardrop shape and are formed from glacial reworking of underlying till or moraine. Streamlined bedrock are lineation features within exposed bedrock that occur during the advancement and the retreat of glaciers where erosional striations occur. Crag-and-tail features form as a glacier moves across an area of resistant rock while eroding surrounding softer rock, resulting in a protruding outcrop (crag). The softer rock that is eroded (tail) remains as a gradual, gentle sloping fan or ridge. Drumlins,

streamlined bedrock and crag-and-tail are features which indicate the direction and orientation of the paleo-glacier, which in this area is orientated northwest to southeast.

Drumlins, streamlined bedrock and crag-and-tail features are orientated in a general northwest-to-southeast trend across the study area. Still, none are located within the Site boundary, as shown in Figure 7-4. Hummocky sand and gravel landscapes are recorded to the northwest and southeast of the Murrens Supraglacial Delta and are generally in line with the orientation of other glacial features within the study area.

The Murrens Supraglacial Delta and the Finnea-Murrens Esker are classified as geological heritage sites known as Murrens and Finnea-Murrens Esker respectively. Additional information on these features is presented in Section 7.3.4.5.

Figure 7-4: Glacial Landforms



7.3.4.4 Bedrock Geology

According to GSI mapping [7], the bedrock beneath the majority of the Site is comprised of cherty limestone and minor shales known as the Derravaragh Cherts unit (Palaeozoic era, Carboniferous period, Mississippian subperiod) as shown in Figure 7-5 below. According to the GSI reports on geological heritage sites of Westmeath Mullingar Bypass [14], the Derravaragh Cherts unit occurs in the upper part of the Lucan Formation. Cherts consist of unfossiliferous thinly bedded calcisiltites and wackestones interbedded with the shales. The chert layers within the Derravaragh Cherts formation are often regionally referred to as 'Festoon cherts' due to their nodular and 'chain-like- impressions. According to the GSI reports on Geological Heritage sites of Westmeath Lough Derravaragh [15], the cherts in this formation are resistant to erosion and is comprised of multiple concentric thin bands of chert rock.

The northeastern section of the Site including the main office and main entrance from the R195 to the quarry is comprised of dark limestone and shale known as the Lucan Formation (Palaeozoic era, Carboniferous period, Mississippian subperiod). According to the GSI reports

on Geological Heritage sites of Westmeath Mullingar Bypass [14], this formation is representative of basinal marine facies and often referred to as Lower 'Calp' limestone.

Bedrock outcrops to the southeast of the Site shows the area is gently dipping at a 15° angle in a general southeast direction.

According to GSI mapping [7], large faults are present across the wider area including a fault that divides the Derravaragh Cherts and the Lucan Formation within the Site, which is orientated northwest to southeast. A second fault is located ca. 1.5 km north of the Site and is orientated east to west. The faults intercept at a 45° angle.

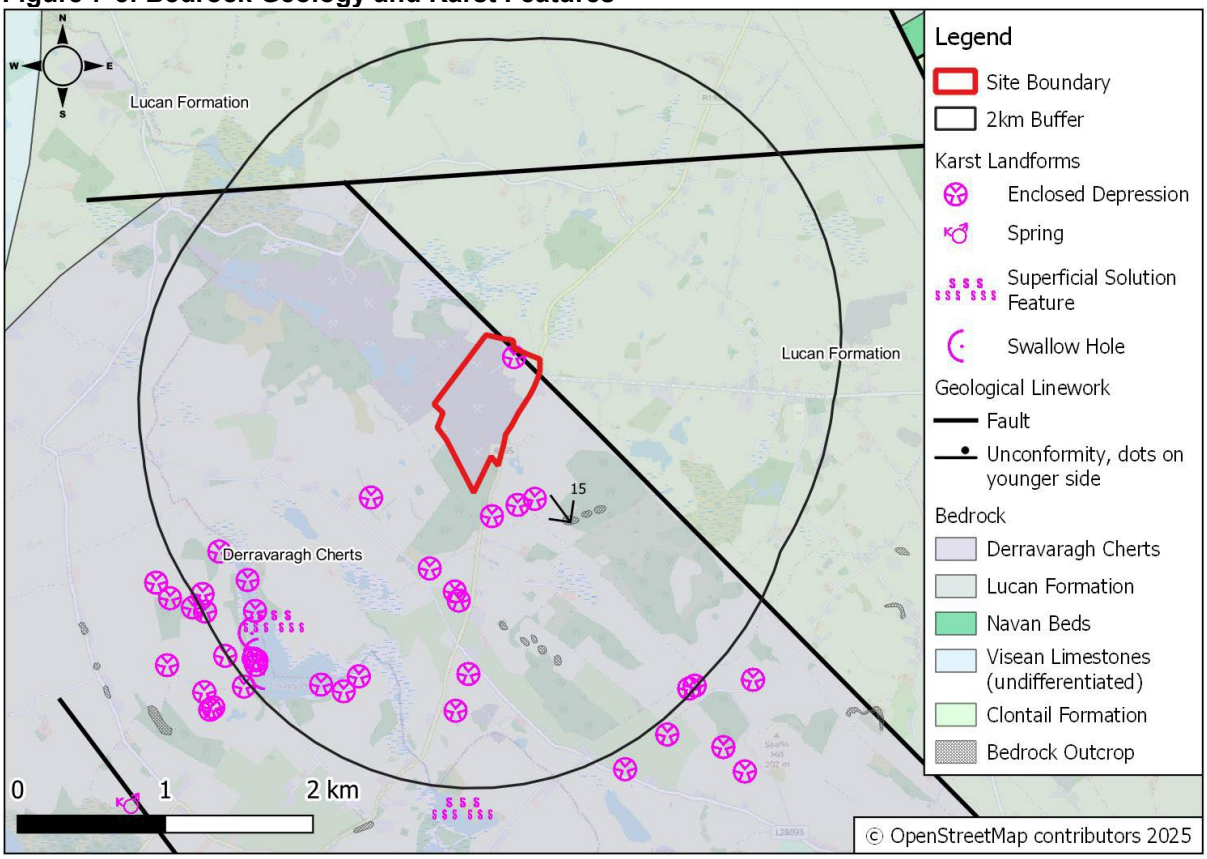
7.3.4.5 Karst Features

GSI mapping [7] shows a karst landform known as an enclosed depression along the northern boundary of the Site. Enclosed depressions are regarded as the most common landforms of karst. They function to funnel rainfall and runoff vertically down to recharge the underlying bedrock aquifer. The smallest of these features are termed dolines. These are formed by two main methods, i.e. the slow solutional removal of rock from the surface downward (solution doline) or by the collapse of overlying rock or overlying material into an underground cave or chamber (collapse doline). Most dolines are considered polygenetic in origin and are usually formed from a combination of solution and collapse.

This enclosed depression mapped within the Site can be clearly seen in the 2006 – 2012 satellite imagery. However, this area has since been reworked and undergone excavation in correspondence with extraction activities, and hence the feature was not observed during a site walkover. Bedrock was also not observed in this excavated area, so it is assumed that there was no connection between the mapped enclosed depression and the underlying bedrock aquifer.

There are several karst features present in the south of the study area and are predominantly classified as enclosed depressions. Superficial solution features are mapped along the eastern shore of White Lough and three swallow holes are mapped along the western shore of the lake. Additional information on karst features is presented in Section 7.3.4.8.

Figure 7-5: Bedrock Geology and Karst Features



7.3.4.6 Geological Heritage

The Site lies within the Murrens County Geological Site (CGS) (Site Code: IGH7). According to the Meath County Geological Site Report for Murrens [11], the site is described as a wooded ridge – esker and hummocky ground including gravel pit. The geological and geomorphological interest in the site is due to the long, beaded esker system that feeds into a large, supraglacial delta complex with flanking fans and kames. The Murrens extends from County Westmeath to Meath over a distance of 15km and comprised of 11 segments and includes glacio-geological features of eskers and a fan and delta system. The Murrens corresponds to the hummocky landscape discussed in section 7.3.4.3 above.

In terms of site importance, the report states:

> *"This site is of very good quality, showing spectacular topography. Unique in Ireland and of international importance, the esker will be recommended for NHA designation."*

The Finnea-Murrens Esker (Site Code: IGH 7) geological heritage site is located ca. 1.8km northwest of the Site. According to the Meath – County Geological Site Report for Finnea-Murrens Esker [16], the site is described as long, linear series of esker sand and gravel segments deposited under ice sheet as they withdrew north-westwards across northwest Meath and north Westmeath at the end of the last Ice Age. The geological and geomorphological interest in the site is due to the preservation of the feature including its elevated ridge of sands and gravels. The feature is also important in representing paleo-flow of the glacier's orientation.

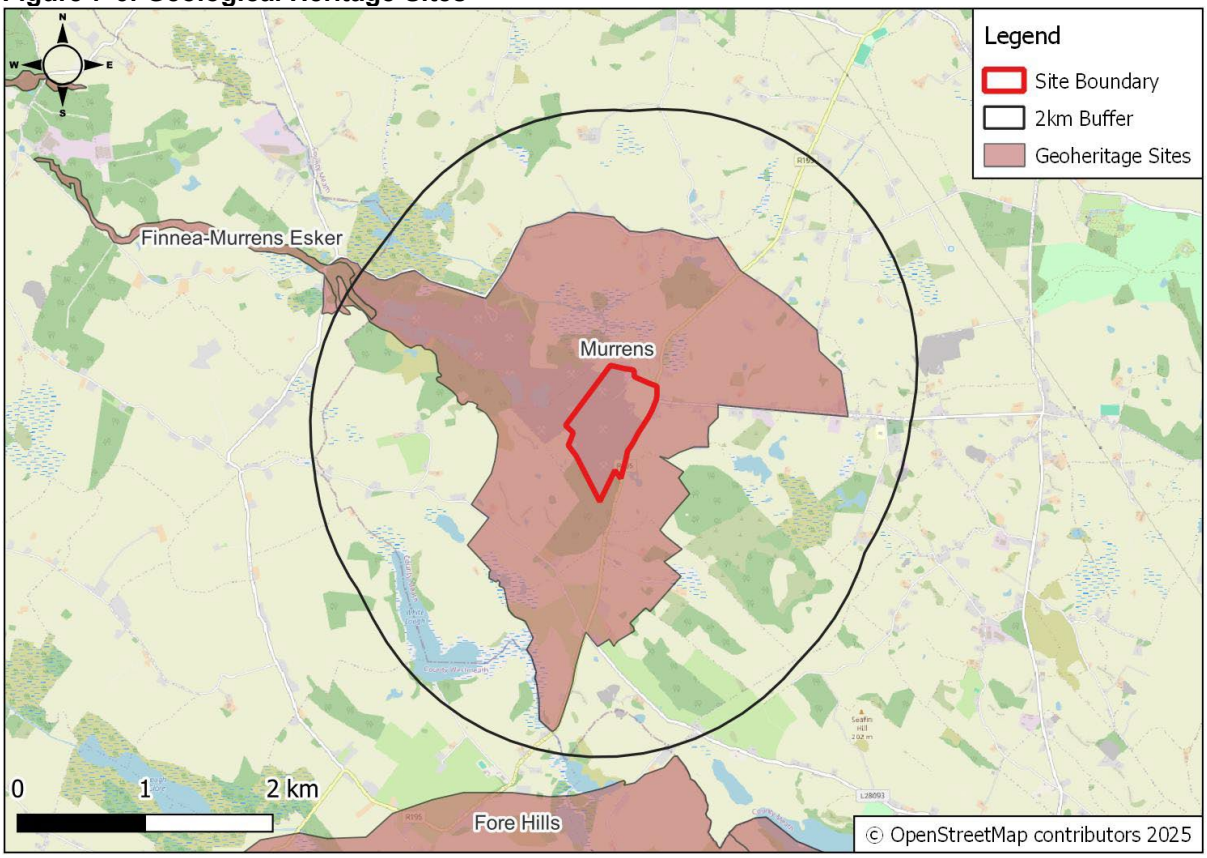
In terms of site importance, the report states:

> *"This esker and the associated sands and gravels in the locality seem to be a good example of a deglacial, meltwater-deposited complex… The southeasternmost*

extremity of the esker, in Tonashammer Townland, has been designated part of an NHA…"

Geological heritage sites are considered the best geological heritage sites within the Republic of Ireland. They are, therefore, included in County Development and County Heritage Plans and are protected under their respective county policy. Geological heritage sites are shown in Figure 7-6 below.

Figure 7-6: Geological Heritage Sites



7.3.4.7 Land use and Economic Geology

The Site contains economically valuable aggregate deposits (sand, gravel and limestone), representing a strategic natural resource commonly used in the production of concrete, asphalt, road base, and other construction materials. These materials form part of the region's broader mineral aggregate resource base and contribute directly to the supply chain of the construction and infrastructure sectors at both local and regional levels.

It is noted that the quarrying activities within the Site and the adjacent quarry provide an economic benefit to the area.

The Site's economic geology is defined by the presence of hummocky sand and gravel deposits formed during the region's deglaciation. These deposits, classified as gravels derived from limestones, are of commercial value due to suitability for a wide range of aggregate applications. The composition and grading of the material are consistent with current market specifications for general fill, structural fill, and concrete-grade aggregate.

The Site's development for quarrying purposes will enable the sustainable extraction of this aggregate resource. This will support the continued availability of local raw materials and reduce reliance on more distant sources, reducing transport emissions and costs. The resources at this location are also important in terms of ensuring the continuity of regional supply in line with national policy objectives for sustainable minerals development [17].

The Proposed Development aligns with the objectives of the National Minerals Policy Framework [18]. It supports the responsible use of natural resources by ensuring that the extraction of high-quality aggregate is undertaken in a controlled, environmentally managed, and economically efficient manner.

7.3.4.8 Geohazards

Karst Features

According to the GSI [7], karst features within a landscape can cause difficulties for planning and developments due to the following hazards and issues:

- Karstic environments include dissolution landforms such as sinkholes and other enclosed depressions;
- Dissolution landforms can affect infrastructure and development stability due to unanticipated settlement of sediments within such landforms;
- Karstic landscapes are susceptible to land collapses;
- Lowering of the water table, mining activities or damage to water mains or pipes can often induce man-made sinkholes to develop;
- Underground cavities can also act as pathways along which contaminants and spills can travel, often travelling long distances relatively quickly; and,
- Karst Features can pose a potential flood risk in relation to groundwater flooding.

It is noted that karst is an ever evolving and dynamic underground environment. Therefore, new features can appear at the surface over time and older features may become inactive. Although karst is mapped in the general area to the south of the Site, no karst features were identified in the immediate area of the Site during the site walkover. A review of the OSI 6" and 25" historic maps and aerial photography available in the GSI public data viewer as basemaps, did not identify and features which could be karstic in nature within the immediate area of the Site.

Landslide Susceptibility

According to the GSI database [7], landslide susceptibility within the Site ranges from Low (inferred) to Moderately Low. Mapped areas of Moderately Low susceptibility areas coincide with several small areas related to stockpiles within the centre of the quarry. It is noted that there are no recorded landslides within the 2km study area. The closest recorded landslide relates to a single event ca. 18.3km southeast of the Site in the Girley Bog in Chamberlainstown, County Meath. The event occurred on 1st January 1999, with details of the event unavailable.

Southeast of the Site, the area is classified as having a Moderately Low to High susceptibility. The area corresponds with topographic highs as noted in Section 7.3.3.

7.3.4.9 Contaminated Land

According to EPA Maps [8], there are no facilities which hold an EPA-issued license or other types of permits within the 2km study area. The nearest facility which holds an EPA-issued license is the Ballinamoney Farms Unlimited Company ca. 4.1km northeast of the Site. The farm holds an Industrial Emissions Licensing facilities ('IEL') licence and an Integrated Pollution Prevention Control facility ('IPCC') licence.

Additionally, Snow's Quarry, ca. 5.4km east, holds a Section 4 Discharge licence granted by the Meath County Council.

7.3.5 Site Specific Environmental Setting

7.3.5.1 Topography

A site-specific topographic survey was conducted by SixWest in December 2024 [10] and is presented in Drawing No. MM250507-04 'Existing Site Layout' of the planning drawings accompanying this EIAR. Results of this survey show that the Site has been extracted to various depths. The minimum elevation within the Site is recorded as 114 mOD in the southern section in an area characterized by standing water. The maximum elevation within the Site is recorded as 152 mOD within the centre of the Site which corresponds to a stockpile located to the northwest of a vegetated area.

The ridge height around the quarry ranges:

- From 130 mOD to 136 mOD along the northern site boundary;
- From 130 mOD to 146mOD along the eastern site boundary;
- From 132 mOD to 140 mOD along the southern site boundary; and,
- From 134 to 140 mOD along the western site boundary.

The Proposed Development includes extraction activities within two areas of the quarry, namely Extraction Area A within the eastern section of the Site and Extraction Area B within the northeastern section of the Site. The two proposed excavation areas will be excavated down to a uniform depth of 119 mOD.

Extraction Area A covers an area of 23,892m^2 and will provide an extraction volume of 222,500 m^3. The topography of this area ranges from 132mOD to 140mOD.

Extraction Area B covers an area of 39,639m^2 and will provide an extraction volume of 239,000m^3. The most northeastern section to be quarried requires movement into a greenfield site which has not been exposed to previous quarrying activities. The topography of this site ranges from 122mOD to 124mOD.

7.3.5.2 Soils and Quaternary Geology

As observed during the site walkover carried out on the 27th November 2024, the majority of the site is comprised of glacio-fluvial material and gravels. However, these materials are absent in the eastern side of the Site, where soft Limestone bedrock is present.

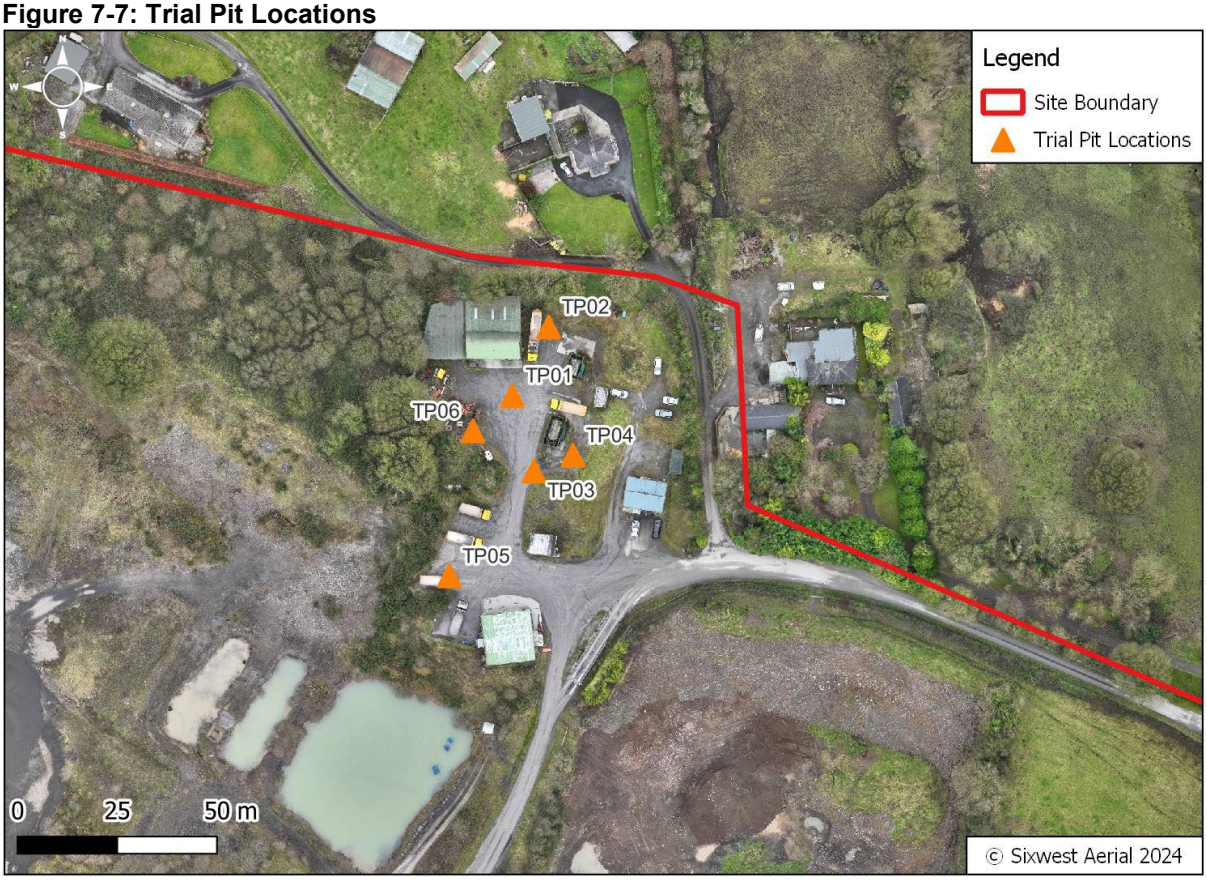
Trial pits excavated as part of the site investigation programme identified the following soil layers underneath the northern area of the Site:

- Made ground – bitmac; brown, slightly gravelly fine to coarse SAND and firm brown, slightly sandy, slightly gravelly CLAY with low to medium cobble content and occasional rootlets and plastic throughout;
- Gravel layer – Light brown to grey, slightly sandy, slightly clayey, angular fine to coarse GRAVEL with medium cobble and boulder content; and,
- Sand layer - Light orangish brown to dark brownish grey gravelly, slightly clayey, fine to coarse SAND. Cobbles and boulders present with depth.

The sand layer was identified to a depth of 4.5m below ground level ('mbgl'), corresponding to a topographic level of 122.1 mOD. However, the depth of these subsoils in BH01 in the northern section of the Site was proven to be eight meters thick and present down to 112.36 mOD. Subsoils toward the southern section of the Site are thinner with only 3m of subsoils identified at BH03, however this is attributed to quarrying activities excavating the sand and gravel deposits in the west and south of the Site.

Refer to Appendix 7-1 for the Causeway Geotechnical site investigation report [12] and Figures 7-7 and 7-8 for the site investigation locations.

Figure 7-7: Trial Pit Locations



A total of 12 soil samples were collected for testing from trial pits TP01-TP06. Soil samples were collected by a MOR Environmental geologist at each sampling location at various depths. This was to ensure that testing was carried out in a manner that would be spatially representative, and which targeted areas of interest identified during the trial pitting.

Soil samples were placed into labelled containers supplied by Element Ltd, a UKAS and ISO 17025 accredited laboratory. The samples were kept cool, in darkness and sent to Element Ltd. for analysis. In order to maintain sample integrity, a Chain of Custody ('CoC') document was completed to track sample possession from the time of sample collection to the time of analysis. Table 7-4 details the sample location and depths.

Table 7-4: Trial Pit Location Elevations and Sampling Depths

Trial Pit ID	Coordinates		Ground Elevation (mOD)	Hole Depth		Sample Depths (mbgl)	Corresponding Strata Layer
	Easting	Northing		mOD	mbgl		
TP01	652643.1	775151.5	128.2	123.7	4.5	0.00 – 0.50 0.50 – 1.50 1.50 – 2.50 2.50 – 3.50	Made ground Made ground Made ground/ Gravel Gravel
TP02	652652.2	775168.7	128.49	125.99	2.5	0.00 – 0.50 1.50 – 2.50	Sand Sand
TP03	652648.5	775132.6	127.8	125.1	2.7	0.00 – 0.50	Sand
TP04	652658.3	775136.6	128.12	123.62	4.5	0.00 – 0.50	Made ground

Trial Pit ID	Coordinates		Ground Elevation (mOD)	Hole Depth		Sample Depths (mbgl)	Corresponding Strata Layer
	Easting	Northing		mOD	mbgl		
						0.50 – 1.50	Made ground
TP05	652627.3	775106.4	126.62	122.12	4.5	0.00 – 0.50	Made ground
TP06	652633.2	775142.7	128.23	125.73	2.5	0.00 – 0.50 0.50 – 1.50	Made ground Sand/ Made ground

Notes:
mOD denotes meters ordnance datum.
mbgl denotes meters below ground level.

In the absence of specific Irish guidelines on soil quality, analytical results for soil samples collected from the Site were compared to Generic Assessment Criteria ('GAC') for human health risk assessment. These generic assessment criteria for soil apply to the United Kingdom and are used for guideline purposes. They have no statutory basis in Ireland but are recommended in the EPA Guidance [5]. The GAC used included the following:

- Suitable for Use Levels ('S4ULs') LQM/CIEH [19];
- Development of Category 4 Screening Levels ('C4SL') for Assessment of Land Affected by Contamination [20]; and,
- Soil Generic Assessment Criteria ('GAC') Contaminated Land: Applications in Real Environments ('CL:AIRE') [21].

The GAC for commercial land use (hereafter referred to as 'Commercial GAC') was used to screen all soil analytical results.

The 12 soil samples were analysed for the following parameters:

- Soil indicators: total organic carbon, organic matter, cyanide, sulphide, fluoride and chloride;
- Asbestos;
- Metals: antimony, arsenic, barium, cadmium, chromium, copper, lead, mercury, molybdenum, nickel, selenium, zinc and total sulphate;
- Total organic carbon ('TOC');
- Methyl tert-butyl ether ('MTBE'), Benzene, toluene, ethylbenzene and total xylenes ('BTEX') and phenol;
- Polychlorinated biphenyls ('PCBs');
- Extractable petroleum hydrocarbons ('EPH'), including mineral oil; and,
- Polycyclic aromatic hydrocarbons ('PAHs').

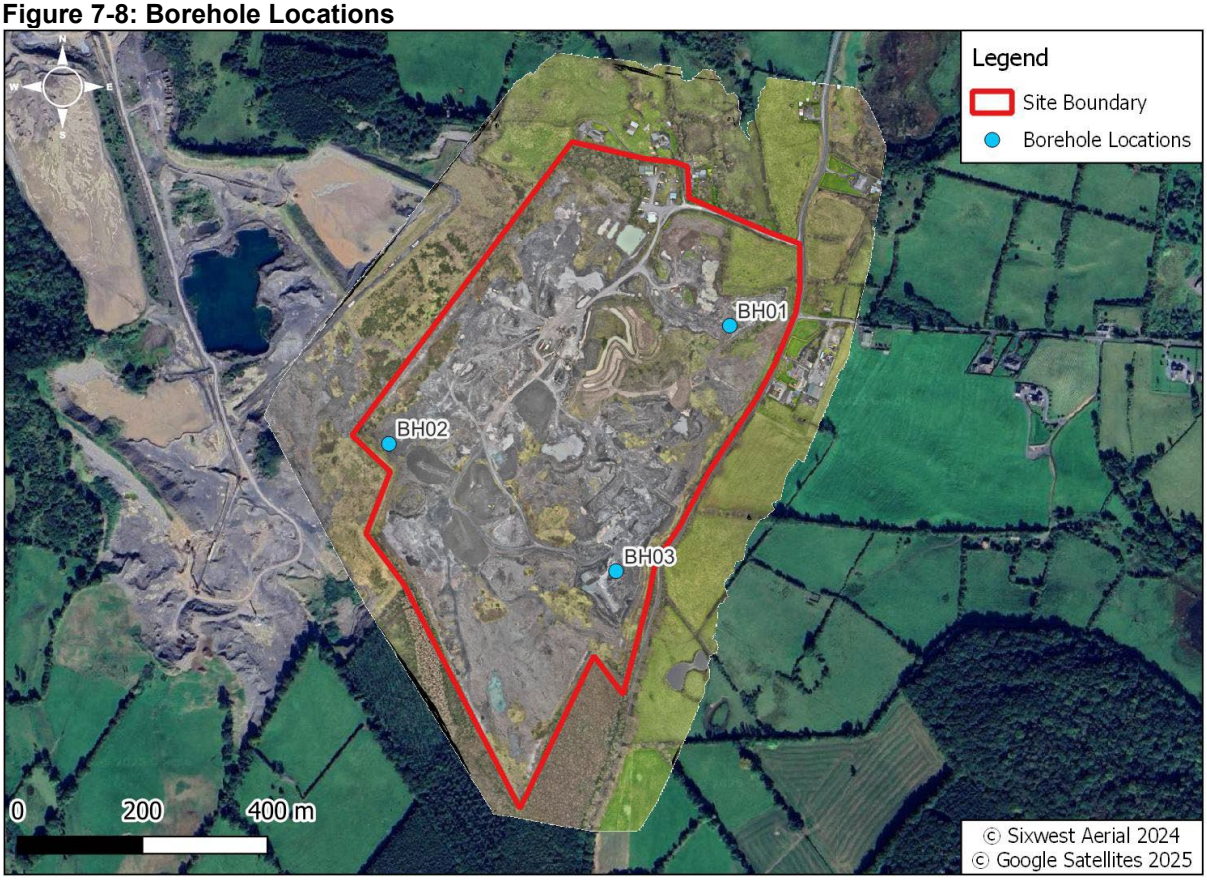
None of the samples at any of the locations showed exceedances for the above parameters with the exception of asbestos at TP06 (0.00 – 0.50 mbgl) in the form of Chrysotile fibres of low quantity (<0.001 mass percentage). Traces of mineral oil and elevated concentrations of EPH were found at TP06 (0.00 – 0.50 mbgl, 0.50 – 1.50 mbgl) and TP02 (1.50 – 2.50 mbgl) were interpreted by the lab as 'trace of lubricating oil', 'trace of possible lubricating oil', and 'trace of diesel' respectively. Full results of the laboratory analysis are available in Appendix 7-2 with an accompanying soils table of tabulated results within Appendix 7-3.

7.3.5.3 Bedrock Geology

Findings from the Causeway Geotechnical report [12] and field observations show that limestone bedrock is at surface in the east of the Site (BH03) where the limestone quarry of the Site is located. The limestone bedrock in the north (BH01) and in the west (BH02) of the site lies between ca. 112mOD to 115mOD underneath the glaciofluvial deposits.

Borehole installation monitoring and groundwater monitoring are further discussed in Chapter 8: Water.

Figure 7-8: Borehole Locations



Locations and further details of the 2025 borehole monitoring locations are outlined in Table 7-5 below.

Table 7-5: Quarry Borehole Locations and Elevations

Borehole ID	Coordinates		Ground Elevation (mOD)	Depth of Borehole		Depth to Bedrock (mOD)
	Easting	Northing		(mbgl)	(mOD)	
BH01	652767.20	774919.70	120.36	12	108.36	112.36
BH02	652221.50	774730.80	128.65	20	108.65	128.65
BH03	652585.10	774527.30	118.58	10	108.58	115.58

7.4 Conceptual Site Model

The conceptual site model ('CSM') relating to land, soils and geology for the Murrens Quarry and study area was developed based on the information presented in Chapter 3 of this EIAR and on information collected from the desk study and site-specific surveys as presented in Section 7.3 of this Chapter.

In summary, the Site is located within a hummocky landscape characterised by geomorphological fluvioglacial features such as eskers and a supraglacial delta. These features form the Murrens Supraglacial Delta and the Finnea-Murrens Esker and are classified as Geological Heritage Sites.

The current land use is quarrying activities for the extraction of sand, gravel and limestone aggregate. The soils and subsoils underlying the Site are predominantly fluvioglacial sand and gravel deposits, which also contain cobbles and boulders. Cherty, limestone bedrock is present in the east of the Site and is identified as the Derravaragh Cherts formation.

There are no geohazards or EPA-licensed facilities of concern within the study area.

The CSM is further developed upon in Chapter 8 of this EIAR. This is to present information gathered on the hydrogeological (groundwater) environment and the hydrological (surface water) environment. This, in turn, provides a full understanding of the subsurface environment as a whole and its interconnection to the surface.

Refer to section 8.4 of Chapter 8 of this EIAR for a visual representation of the CSM.

7.5 Characteristics and Potential Effect of Development

The characteristics and potential effects of the Development have been identified as follows:

- The effect on land use resulting from a change in use facilitating the Proposed Development;
- The effect on soils from the Proposed Development;
- The effect on geology from the Proposed Development;
- The effect of extraction of bedrock aggregates on the Murrens geological heritage site; and,
- The release of pollutants from plant and equipment onto the land, soils and geology (and subsequent risks posed to human health and the environment).

The Proposed Development will entail the removal of soils and the excavation of subsoils and bedrock within two main areas of the existing quarry (i.e. Extraction Area A and Extraction Area B), extraction and aggregate screening processes, loading and maintenance of transport vehicles and mechanical equipment, as well as ongoing and future remediation measures within the Site boundaries.

This will involve three distinct stages/ phases in relation to geology and soils:

- Stage 1 (pond reconstruction and Site preparation), comprising:
    - Removal of vegetation and topsoil in necessary areas; and,
    - The creation of two new ponds and the restoration of existing quarry habitat to a low nutrient landscape;

Table 7-6: Proposed Removal of Material for Ponds

Ponds	Length (m)	Width (m)	Depth (m)	Volume of Material to be Removed (m^3)
Pond 1	26	37	1	962
Pond 2	32	38	2	2,432
Total				**3,394**

- Stage 2 (extension and levelling of quarry floor in the north of Site, deepening and levelling of quarry floor in the east of Site and stockpile removal), comprising:
    - Removal of bedrock aggregate within a 23,892m2 area (Extraction Area A) in the eastern section of the Site to a uniform elevation of 119mOD;
    - Excavation of sand and gravel aggregate within a 39,639m3 area (Extraction Area B) in the northeastern section of the Site to a uniform elevation of 119mOD; and,
    - Removal of existing stockpiles within the quarry.
- Stage 3 (immediate reinstatement/ remediation and future reinstatement/ remediation), comprising:
    - Spreading of soil (non-aggregate) stockpiles across the non-operational area of the Site to level out the ground;
    - Importation of clean uncontaminated soil as needed; and,
    - The removal of all plant equipment from the Site.

These three stages have been dealt with separately as the effects associated with each are distinct.

7.5.1 Stage 1 (Pond Reconstruction and Site Preparation)

As part of Stage 1, vegetation and soil removal in the northeast will take place in several areas to prepare for aggregate extraction. These soils are currently identified as having agricultural land use; however, section 7.3.4.1 identifies them as poorly drained soils and as such, they represent a low importance receptor. This reworking will alter soil characteristics, leading to a small adverse impact. From this, based on Table 7-3, the removal and stockpiling of this material will be a negative, not significant effect.

The construction of two ponds within the southwest of the Site has been proposed. This will include the excavation and removal of up to ca. 3,394m^3 of soils and subsoils, including sands and gravels (See Table 7-6). Once material has been removed, it is proposed that the ponds will be lined with imported inert soils/ clay. Soils removed during these excavations of the ponds will be stockpiled onsite to be later used during Stage 3 for restoration and remediation. Based on Table 7-1, the soils are of low significance, as they represent soils derived from crushed rock and other material such as dust from quarry activities and as such are likely of limited organic content. The proposed works represent a small adverse effect based on Table 7-2, as the works are the excavation of a small proportion of mineral soils beneath the development. Therefore, based on Table 7-3, the removal and stockpiling of material related to the ponds will be a not significant negative effect.

7.5.2 Stage 2 (Extension and Levelling of Quarry Floor in the North of the Site, Deepening and Levelling of Quarry Floor in the East of Site and Stockpile Removal)

Proposed works during Stage 2 of the Proposed Development include continued extraction in the north and east of the Site, as well as new extraction within the greenfield site in the northeastern section of the Site prepared in Stage 1. It is proposed that both areas will undergo excavation to a maximum, universal depth of 119mOD and will result in a total extraction volume of 461,500m^3.

The quarry extension is within the Murrens CGS, which, based on NRA Guidance [3], is of high importance as a geological attribute. The removal of bedrock/aggregate will impact the CGS; however, the proposed extracted area within the Site constitutes <0.5% of the total area of the CGS. Therefore, this is a negligible to small adverse magnitude impact from the removal of a small part of a high importance receptor, based on Tables 7-1 and 7-2. This represents a

slight to not significant negative effect on the CGS. Since the internal structures of the moraines, which cannot be reinstated after reworking of soils in and within the esker systems within the quarry, will result this effect on the local geological heritage and glacial landforms, it should be considered irreversible.

It is noted in the IGI guidelines [1] that the Proposed Development is considered to be of at least "high" importance due to being a moderately to large-sized existing quarry and having proven economically extractable mineral resources. The fluvioglacial soils and limestone bedrock within the quarry are therefore considered to be of at least "high" importance as they are both considered to be economically extractable mineral resources with a high significance or value on a national scale. Since these soils and bedrock are regarded as of "very high" importance due to their value as an extractable resource, the magnitude of the impact on these soils and bedrock from quarrying activities is considered "negligible". Therefore, the significance of effect in continuing to extracting this economic resource is considered "not significant".

7.5.3 Stage 3 (Immediate Reinstatement / Remediation and Future Reinstatement/ Remediation)

Restoration and remedial measures include a plan that will be implemented to offset for the loss of any habitats as a result of historic and future activities at the Site. The ecological enhancements within this remediation plan have been developed, taking into consideration the species that use or have the potential to utilise the area following the implementation of the plan. This phase includes habitat creation that is detailed within Section 6-7. It is noted that stockpiled topsoil and subsoil material stored onsite will be used where required, for the restoration phase and supplemented through the importation of clean, uncontaminated soils.

A woodland planting of ca. 620m^2 is proposed within the southern tip of the Site. This enhancement measure will include planting of trees as part of a nursery across the area. Square tree pitting will require the removal of soils with dimensions to be 100mm greater than the root systems of the trees with the depths of the pits not exceeding the tree root ball. The soils removed will be reused around the root system to give structure to the planted tree, with excess soil spread locally around the planting position.

The reworking of soils for the restoration phase and replacement of imported material will pose a very low contamination risk as no harmful contaminants will be present. Additionally, the restoration of the Site will result in a minor enhancement to Geological Heritage Site from a visual viewpoint.

Hence, the overall impact on the land, soils and geological environment during Stage 3 will be minor, beneficial and result in a neutral, imperceptible effect.

7.5.4 Oil Storage / Refuelling / Leaks and Spills

Beyond effects specific to each Stage, the use of fuel-powered equipment and heavy machinery across the Site represents a hazard to land and soils in each stage. There will be the potential for an effect on land, soils and geology due to the risk of accidents or spillages from chemicals stored on-site (e.g. leakage of fuel), as well as from any accidental spill/ leakage from vehicles parked in parking areas or from on-site fuel storage used for maintenance equipment and loading vehicles. The area effected would be restricted to in and around the spill, which, based on Table 7-1, would have of low significance for soils, as they are derived from crushed rock and other material such as dust from quarry activities, and as such are likely of limited organic content. Spills over areas of still extractable or extracted aggregate would be affecting a high significance receptor, such as economic extractable mineral resources. In both cases, the magnitude of effect would be medium-small adverse based on Table 7-2 due to contamination of the affected area with hydrocarbons, effecting either the soil quality or value/usability of the aggregate, though it is dependent on the scale of the spillage/leak occurring and fuel volumes onsite. As such, the worst-case effects for

hydrocarbon / chemical release for soils is slight to not significant negative effect and aggregate a moderate to significant negative effect.

7.5.5 Unplanned Events

As with all industrial facilities, there is some risk of accidents at the Site or disasters outside of the operator's control, which could result in a potential risk to the environment. Using a risk-based approach, the primary accidents that have the potential to have an impact on land and soils in the vicinity of the Site are set out in Table 7-7 below.

Table 7-7: Land and Soils Unplanned Events

Hazards	Likelihood	Consequence	Reasoning
Collision / accident involving delivery truck arriving at / departing from the Site resulting in the release of substances	2	3	Measures will include but will not be limited to the following: • Speed limits and a traffic management system will be implemented on-site; • Operational procedures as part of the facility's Environmental Management System ('EMS') will be in place for incoming and outgoing materials; and, • An adequate supply of suitably absorbent materials will be kept on site to deal with any spills.
Leakage from bunds and drainage system to ground	2	3	All bunding and drainage systems will be designed in accordance with best practice, and; appropriate EPA guidance. Measures will include but will not be limited to the following: • All drainage systems will be inspected on a regular basis.

(1) Likelihood rating 1-5 where 1 is very unlikely and 5 is very likely
(2) Consequence rating 1-5 where 1 is trivial and 5 is massive

7.6 Mitigation Measures

The mitigation measures for the protection of soils and geology are described below. Some mitigation measures outlined in Chapter 6 (Biodiversity) are also applicable to the protection of soils during the different stages/ phases of the Proposed Development.

7.6.1 Stage 1 (Pond Reconstruction and Site Preparation)

To minimise the potential effects arising during Stage 1 on land, soils and the geological environment, the works will be carried out taking cognisance of the best practice procedures.

Mitigation measures detailed in Chapter 8 – Water and Chapter 9 – Air, are also applicable to land, soils and geology.

7.6.1.1 Stripping of Vegetation and Soils

During the removal or disturbance of soils during pond reconstruction and vegetation removal as well as excavation processes, the following mitigation measures will be adhered to:

- The stockpiles will be clearly segregated by sediment clast size;
- Stockpiles potentially subject to wind entrapment, i.e. finer sands, will be dampened down during dry periods to prevent wind dispersion; and,
- Any available topsoil will be stripped and stored separately for use in final restoration.

7.6.2 Stage 2 (Extension and Levelling of Quarry Floor in the North of Site, Deepening and Levelling of Quarry Floor in the East of Site and Stockpile Removal)

Mitigation measures during Stage 2 of the Proposed Development will be similar to the previously listed measures for Stage 1 and therefore the previous section measures are applicable for Stage 2.

The progressive restoration (following extraction) of the proposed extraction areas is seen as a positive effect with respect to land, soils and geology. The mitigation will include the adoption of a suitable restoration plan which considers the natural local topography and land-use. Refer to Chapter 6.7.

7.6.3 Stage 3 (Immediate Reinstatement/ Remediation and Future Reinstatement / Remediation)

Mitigation measures during Stage 3 of the Proposed Development will be similar to the previously listed measures for Stage 1, and therefore, the previous section measures are applicable for Stage 3.

The following proposed mitigation measures apply to the Site for the importation of clean, uncontaminated soil:

- Acceptance criteria for the incoming materials would need to be adhered to as per the National By-Product Criteria Ref No. BP-N002/2024 [22];
- Sourcing material that is determined to be a by-product prior to transport to the Site;
- Pre-agreed source sites for inert material, ensuring no pollutants, unauthorised material, or invasive species are present;
- Regular checks of incoming loads to ensure the suitability of imported material;
- All required pollution prevention measures will be implemented at the Site;
- The operator will prepare and implement an emergency response procedure;
- The operator will complete environmental monitoring, including local groundwater and surface water monitoring, during this stage of work;
- A phased restoration of the Site will be implemented, with a low-nutrient landscape use / biodiversity positive implemented land use following restoration;
- The operator will have a documented recording procedure for all by-product material entering the Site; and,
- No unauthorised dumping of waste will be allowed at the Site.

The progressive restoration (following extraction) of the proposed extraction areas is seen as a positive effect with respect to land, soils and geology. The mitigation includes the adoption of the suitable restoration plan presented in Section 6-7, which considers the natural local topography and land-use.

7.6.4 Oil Storage / Refuelling / Leaks and Spills

In order to carry out the works at the quarry, heavy machinery and vehicles will be required. As such, fuels and hydrocarbon oils utilised by machinery and vehicles may pose a risk to land and soils, with hydrocarbon release resulting in a moderate to significant negative effect on economically valuable aggregates and slight to not significant negative effect on soils exposed, dependent on the scale of release. As such mitigation will be required.

In order to minimise the impacts on land, soils and geology from potential spills and leakages, the following measures will be implemented:

- All plant and machinery will be serviced before being mobilised to the Site;
- Refuelling will be completed in a controlled manner using drip trays (bunded container trays) at all times;
- Drip-trays will be used for fixed or modular mobile plant in order to retain oil leaks and spills;
- Only designated trained operators will be authorised to refuel plant on-site;
- Procedures and contingency plans will be set up to deal with emergency accidents and spills; and,
- An emergency spill kit with oil boom, absorbers etc. will be kept on-site for use in the event of an accidental spillage.

7.7 Cumulative and In-Combination Effects

The potential cumulative effect of the extraction onsite is the degradation of the Murrens CGS, which contains large areas of high aggregate potential, through combined extractive activities across the CGS. A study of the planning permission records of both County Meath and County Westmeath shows that there are at least two active quarries within the Murrens CGS, including the Site. The total area covered by the Site is ca. 40.12ha, which represents ca. 6% of the Murrens CGS. Based on Tables 7-1 to 7-3, the CGS is a high importance receptor undergoing cumulative small-medium adverse magnitude impact from the removal a part of a geological heritage feature. As such, by IGI methodology, the cumulative effect arising on the CGS from this and other quarries in the CGS is negative and moderate in nature.

7.8 Interactions with other Environmental Attributes

Land and soils interact with other environmental attributes as follows:

- Chapter 6 - Biodiversity: The alteration of soil conditions on site through the removal of topsoil, subsoil and extraction of aggregate are key elements to the viability of this project. However, this change has the potential to impact biodiversity. The effects on biodiversity are addressed in Chapter 6; however, mitigation measures outlined in this chapter are considered appropriate with regards to Chapter 6;
- Chapter 8 - Water: The soil removal may alter the underlying groundwater vulnerability; further assessment is provided within Chapter 8 Water. The effects on water quality are addressed in Chapter 8; however, no likely significant effects were identified;
- Chapter 9 - Air & Climate: the mobilisation of dust through extraction processes such as blasting and crushing can impact air quality. The effects on air quality are addressed in Chapter 9; however, no likely significant effects were identified; and,
- Chapter 11—Landscape & Visual: Modifying local geomorphology and topology through the extraction of bedrock onsite will likely impact the area's visual and landscape character. However, no likely significant effects were identified.

7.9 Indirect Effect

No indirect effects are observed as part of the Proposed Development.

7.10 Residual Effect

The quarry areas of the Site will be without soils and will develop "soils" comprised from quarry source material, that even when covered over with the mixed overburden represents different

subsoil conditions than before. This, as the permanent alteration of the original soil character from the baseline conditions to a new character derived from reworking and mixing of soils and subsoils during overburden stripping will result in a slight irreversible long-term negative effect provided that the mitigation measures and factors listed in Section 7.6 above are followed.

As remediation will not restore the topography of the Site to conform with the glacial landforms of the area and internal structures of the glacial landforms cannot be reinstated, a slight negative effect will remain. However, the overall effect on the CGS will be not significant due to the relative scale of the Proposed Development in comparison to the scale of the CGS.

The final condition of the Site following restoration will be a quarry surrounded by vegetated regions and enhanced habitats. As such, the land will not be suitable for agricultural purposes. Considering the size, the relative availability of agricultural pasture in Ireland, restoration will result in an imperceptible negative effect on the available agricultural pasture. However, the proposed restoration will present an alternative mix of water, bench and boundary planting and the natural re-vegetation of the cliff face over time, which will be a valuable non-anthropogenic land use resulting in a positive, long-term effect (refer to Chapter 6 Biodiversity).

7.11 Monitoring

No monitoring of geology and soils is planned during the Proposed Development.

7.12 Reinstatement

The final phase of the Proposed Development will be to modify the site to a non-operational, restored state. This restoration phase and potential associated effects have been considered throughout this Chapter.

7.13 Difficulties Encountered

No difficulties were encountered when compiling this information.

7.14 References

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1 Table of Contents

FIGURES

TABLES

8 WATER

8.1 Introduction

This chapter of the EIAR has been prepared by the MOR Environmental team. It provides a description and assessment of the likely and significant effects on the hydrological (surface water) and hydrogeological (groundwater) environment, which can reasonably be expected to occur due to the Proposed Development. Where likely significant effects were identified, appropriate remedial measures to reduce or avoid these effects have been outlined.

8.2 Methodology

The study area for the Water assessment has been defined on the basis of a 2 km radius from the Site, as suggested in the Institute of Geologists of Ireland ('IGI') Guidelines [1]. In line with these guidelines and in line with a review of the water environment, the study area may be extended beyond the 2 km radius to reflect the sensitivity of the environmental attributes and the presence of sensitive features which are hydrologically or hydrogeologically connected to the Site and which therefore may be impacted by the Proposed Development.

In order to determine the baseline environment, a desk-based study was undertaken to collect and review background information, a site walkover was carried out and site-specific site investigations were undertaken.

8.2.1 Legislation Context

8.2.1.1 Water Framework Directive

The EU Water Framework Directive (2000/60/EC) ('WFD') [2], as amended by Directives 2008/105/EC and 2013/39/EU, established a framework for the protection of both surface water and groundwater. It was given legal status in Ireland via the European Communities (Water Policy) Regulations 2003 (S.I. 722/2003) [3], as amended.

The WFD outlines the water protection and water management measures required in Ireland to achieve and maintain at least good status of all waterbodies and prevent any deterioration in water status. Water bodies comprise both groundwater bodies and surface waterbodies, which include rivers, lakes, transitional waters, coastal waters, artificial surface waterbodies and heavily modified surface waterbodies. The achievement of a good status for groundwater bodies is dependent on the water quality status and the water quantity status. The achievement of good status for surface waterbodies is dependent on the biological quality, the physio-chemical quality and the hydromorphological quality of the waterbody.

Since 2010, the Government of Ireland has created River Basin Management Plans ('RBMPs') which operate on a renewing six-year cycle. The purpose of these RBMPs is to set targets to address water quality issues, including the protection, improvement and sustainable management of the water environment, in line with the WFD.

The first cycle of the River Basin Management Plan ('RBMP') ran from 2009-2015 and devised plans for all the River Basin Districts ('RBDs') with the objective of achieving at least 'good' status for all waters by 2015. The second cycle RBMP covered the period 2016-2021 and merged multiple RBDs to form one national RBD.

The third cycle and current RBMP covers the period 2022-2027 and was published in September 2024 under the title 'Water Action Plan 2024' following public consultation [4]. The Water Action Plan 2024 sets out the measures that are necessary to protect and restore water quality in Ireland. The overall aim of the plan is to ensure that natural waters are sustainably managed and that freshwater resources are protected so as to maintain and improve Ireland's water environment. The third cycle plan focuses on integrated catchment planning, with catchment management work plans to be put in place for each of the 46 hydrometric catchments as sub-plans to the national RBMP.

A WFD assessment report for the Proposed Development is presented in Appendix 8-2.

8.2.1.2 Guidance Documentation

The importance and sensitivity of the water receptors within the study area were assessed on completion of the desk study as set out in Table 3-4 of the EPA's 'Guidelines on the Information to be contained in Environmental Impact Assessment Reports'. The Guidelines are formally adopted and published by the EPA [5].

The assessment was carried out in accordance with the following guidance and tailored accordingly based on professional judgement:

- Institute of Geologists of Ireland ('IGI') Guidelines for Preparation of Soils, Geology & Hydrogeology Chapters in Environmental Impact Statements [1];
- CIRIA C532 - Control of Water Pollution from Construction Sites - Guidance for Consultants and Contractors [6];
- Department of Environment, Heritage and Local Government: Quarries and Ancillary Activities - Guidance for Authorities [7]; and,
- EPA Environmental Management in the Extractive Industry (Non-Scheduled Minerals) [8].

8.2.2 Desk Study

A desk study of the Site and surrounding area was carried out to collate available and relevant hydrogeological and hydrological data for the Proposed Development and the study area, using the following data sources:

- Geological Survey of Ireland ('GSI') [9];
- Environmental Protection Agency ('EPA') Maps database [10];
- EPA Catchments [11]: and,
- Office of Public Works ('OPW') 'Flood Maps' [12].

8.2.3 Site Investigations

Intrusive and non-intrusive site investigations were undertaken to characterise the hydrogeological and hydrological environment of the Proposed Development. The investigations included the following:

- A topographical site survey was undertaken in order to survey the area to Ordnance Datum [13];
- Installation of three groundwater wells (BH01, BH02 and BH03) within the quarry Site; and,
- Groundwater sampling from each well in January 2025, which included the following:
    - Field hydrochemistry measurements for groundwater (i.e. electrical conductivity, pH and temperature); and,
    - Laboratory analysis of groundwater samples for a broad range of parameters – results shown in Appendix 8-1.
- Water level measurements at each monitoring well between January 2025 and April 2025.

8.2.3.1 Topographic Survey

SixWest conducted a topographic survey in December 2024 [13] to collect accurate information on the landscape features within the Site. Deliverables from the survey included an ortho map, the elevation of various features and detailed satellite images of the specific areas of the Site. Details for the findings of the topographic investigation are further discussed in Section 7.3.3. The topographic survey is presented within the planning drawings, refer to Drawing No. MM250507-04 'Existing Site Layout'.

8.2.3.2 Monitoring Well Drilling

An intrusive site investigation was undertaken to characterise the geological and hydrogeological environment between 13th and 15th January 2025 [14]. Three new groundwater monitoring wells (BH01, BH02 and BH03) were installed within the quarry Site, refer to Figure 8-8. Causeway Geotech was subcontracted to drill the wells while an experienced MOR Environmental geologist supervised the works.

The monitoring wells were installed at depths ranging from 10mbgl (BH03) to 20mbgl (BH02) using a rotary core drilling rig. During the installation works, the MOR Environmental geologist noted changes in the lithological profile and evidence of water present within the strata layers. Each groundwater monitoring well was logged in accordance with best practice procedures, and visual and olfactory observations were also recorded.

The borehole logs for these wells include details of how the wells were completed and the groundwater monitoring installation in each. These records provide insight into the geology underlying the Site. Details of the investigation relating to the Water environment are presented in Section 8.3.5. The Causeway Geotech investigation report is presented in Appendix 7-1 of this EIAR.

8.2.3.3 Groundwater Investigation

MOR Environmental collected groundwater samples from the three groundwater monitoring wells in January 2025. The purpose of this was to inform the site-specific geological setting and determine if the Site has had any lasting negative effects on the water environment. Results of the sampling are presented in Section 8.3.5, and the laboratory report is presented in Appendix 8-1. Refer to Figure 8-8 for the groundwater monitoring well locations.

MOR Environmental carried out groundwater level monitoring between January and April 2025 to gain an understanding of the groundwater flow regime underneath the Site. Results of this monitoring is presented in Section 8.3.5.

8.2.4 Impact Assessment Methodology

Following on from the identification of the baseline environment, the available data was utilised to identify and categorise potential effects on the hydrological and hydrogeological environment as a result of the Proposed Development.

The significance of effects due to the Proposed Development has been assessed in accordance with the EPA guidance document 'Guidelines on the Information to be Contained in Environmental Impact Assessment Reports' [5]. These are outlined in Chapter 1 (Introduction) of this EIAR and are dependent on the sensitivity of the environmental attributes and the magnitude of the impact.

The sensitivity of the hydrological and hydrogeological environment was assessed on completion of the desk study. Using the table presented in Box 4.2 (hydrology / surface water) and Box 4.3 (hydrogeology / groundwater) of the 2008 NRA Guidelines [15], which is also presented in Appendix C of the IGI Guidelines [1], the sensitivity of the water attributes within the study area is set out in Table 8-1 and Table 8-3 below.

The magnitude of the impact takes into account the likely scale of the predicted change to the baseline conditions and considers the duration of the impact i.e. temporary or permanent. The criteria for determining the magnitude of the impact on the hydrological and hydrogeological environment is based on the table presented in Box 5.2 and Box 5.3 of the 2008 NRA Guidelines [15], which is also presented in Appendix C of the IGI Guidelines [1]. The magnitude of impact on hydrological and hydrogeological receptors is set out in Table 8-2 and Table 8-4 below.

Potential impacts may have a negative, neutral or positive effect on the water environment.

Table 8-1: Sensitivity of Hydrological Attributes

Importance	Criteria	Typical Example
Extremely High	Attribute has a high quality or value on an international scale	River, wetland or surface water body ecosystem protected by EU legislation, e.g. 'European sites' designated under the Habitats Regulations or 'Salmonid waters' designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988.
Very High	Attribute has a high quality or value on a regional or national scale	River, wetland or surface water body ecosystem protected by national legislation – NHA status. Regionally important potable water source supplying >2500 homes. Quality Class A (Biotic Index Q4, Q5). Flood plain protecting more than 50 residential or commercial properties from flooding. Nationally important amenity site for wide range of leisure activities.
High	Attribute has a high quality or value on a local scale	Salmon fishery Locally important potable water source supplying >1000 homes. Quality Class B (Biotic Index Q3-4). Flood plain protecting between 5 and 50 residential or commercial properties from flooding. Locally important amenity site for wide range of leisure activities.
Medium	Attribute has a medium quality or value on a local scale	Coarse fishery. Local potable water source supplying >50 homes Quality Class C (Biotic Index Q3, Q2-3). Flood plain protecting between 1 and 5 residential or commercial properties from flooding.
Low	Attribute has a low quality or value on a local scale	Locally important amenity site for small range of leisure activities. Local potable water source supplying <50 homes. Quality Class D (Biotic Index Q2, Q1) Flood plain protecting 1 residential or commercial property from flooding. Amenity site used by small numbers of local people.

Table 8-2: Magnitude of Impact on Hydrology Attributes

Magnitude	Criteria	Typical Example
Large adverse	Results in a loss of attribute.	Loss or extensive change to a waterbody or water dependent habitat. Increase in predicted peak flood level >100mm. Extensive loss of fishery. Calculated risk of serious pollution incident >2% annually. Extensive reduction in amenity value.
Moderate adverse	Results in impact on integrity of attribute or loss of part of attribute.	Increase in predicted peak flood level >50mm. Partial loss of fishery. Calculated risk of serious pollution incident >1% annually. Partial reduction in amenity value.
Small adverse	Results in minor impact on integrity of attribute or loss of small part of attribute.	Increase in predicted peak flood level >10mm. Minor loss of fishery. Calculated risk of serious pollution incident >0.5% annually. Slight reduction in amenity value.
Negligible	Results in an impact on attribute but of insufficient magnitude to affect either use or integrity.	Negligible change in predicted peak flood level. Calculated risk of serious pollution incident <0.5% annually.
Minor beneficial	Results in minor improvement of attribute quality.	Reduction in predicted peak flood level >10mm. Calculated reduction in pollution risk of 50% or more where existing risk is <1% annually.
Moderate beneficial	Results in moderate improvement of attribute quality.	Reduction in predicted peak flood level >50mm. Calculated reduction in pollution risk of 50% or more where existing risk is >1% annually.
Major beneficial	Results in major improvement of attribute quality.	Reduction in predicted peak flood level >100mm.

Table 8-3: Sensitivity of Hydrogeological Attributes

Importance	Criteria	Typical Example
Extremely High	Attribute has a high quality or value on an international scale	Groundwater supports river, wetland or surface water body ecosystem protected by EU legislation, e.g. SAC or SPA status.
Very High	Attribute has a high quality or value on a	Regionally Important Aquifer with multiple wellfields.

Importance	Criteria	Typical Example
	regional or national scale	Groundwater supports river, wetland or surface water body ecosystem protected by national legislation - NHA status. Regionally important potable water source supplying >2500 homes. Inner source protection area for regionally important water source.
High	Attribute has a high quality or value on a local scale	Regionally Important Aquifer. Groundwater provides large proportion of baseflow to local rivers. Locally important potable water source supplying >1000 homes. Outer source protection area for regionally important water source. Inner source protection area for locally important water source.
Medium	Attribute has a medium quality or value on a local scale	Locally Important Aquifer. Potable water source supplying >50 homes. Outer source protection area for locally important water source.
Low	Attribute has a low quality or value on a local scale	Poor Bedrock Aquifer Potable water source supplying <50 homes.

Table 8-4: Magnitude of Impact on Hydrogeology Attributes

Magnitude	Criteria	Typical Example
Large adverse	Results in a loss of attribute.	Removal of large proportion of aquifer. Changes to aquifer or unsaturated zone resulting in extensive change to existing water supply springs and wells, river baseflow or ecosystems. Potential high-risk pollution to groundwater from routine run-off. Calculated risk of serious pollution incident >2% annually.
Moderate adverse	Results in impact on integrity of attribute or loss of part of attribute.	Removal of moderate proportion of aquifer. Changes to aquifer or unsaturated zone resulting in moderate change to existing water supply springs and wells, river baseflow or ecosystems. Potential medium risk of pollution to groundwater from routine run-off. Calculated risk of serious pollution incident >1% annually.
Small adverse	Results in minor impact on integrity of attribute or loss of small part of attribute.	Removal of small proportion of aquifer. Changes to aquifer or unsaturated zone resulting in minor change to water supply springs and wells, river baseflow or ecosystems. Potential low risk pollution to groundwater from routine run-off.

Magnitude	Criteria	Typical Example
		Calculated risk of serious pollution incident >0.5% annually.
Negligible	Results in an impact on attribute but of insufficient magnitude to affect either use or integrity.	Calculated risk of serious pollution incident <0.5% annually.

Once the importance and sensitivity of the hydrological and hydrogeological attributes are established, the conventional source-pathway-receptor model was applied to assess potential effects on groundwater and surface water from the Proposed Development.

Source

A potential source of impact relates to items or features which have the potential to have an effect on the environment. For example, contaminants such as hydrocarbons which may leak from vehicles or storage tanks.

Pathway

A pathway is an exposure route which the source of impact can take in order to reach an environmental attribute and have an impact on that attribute. For example, contaminants such as hydrocarbons may be able to infiltrate into the ground.

Receptor

A receptor is an environmental attribute which may be impacted upon should a pathway be available to connect the receptor to a source of impact. For example, the soils underneath the site may be considered a receptor which is impacted upon by hydrocarbons infiltrating into the soils due to a leakage in a storage tank.

In instances where a Source-Pathway-Receptor ('SPR') linkage has been established, the impact assessment matrix table presented in Box 5.4 of the 2008 NRA Guidelines [15] and Appendix C of the IGI Guidelines [1], and presented in Table 8-6 below, provides a framework for the consistent and transparent assessment of predicted effects across all technical chapters. However, individual assessments are based on relevant guidance and the application of professional judgement.

In taking the sensitivity of the water attribute and the magnitude of the impact, the significance of the effect is assessed. For the purpose of this assessment, effects rated as being "Significant-Moderate" or above are considered to be significant in EIA terms. Effects rated as being "Moderate" are subject to professional judgement in terms of significance, with a rationale provided for this in the main assessment. Effects identified as less than moderate significance are not considered to be significant in EIA terms.

Table 8-5: Impact assessment matrix

Sensitivity of Receptor	Magnitude of Impact			
	High Adverse	**Medium Adverse**	**Small Adverse**	**Negligible**
Very High	Profound	Profound / Significant	Significant / Moderate	Not Significant
High	Profound / Significant	Significant / Moderate	Slight / Not Significant	Imperceptible
Medium	Significant	Moderate	Slight	Imperceptible
Low	Moderate/ Slight	Slight / Not Significant	Not Significant	Imperceptible

8.3 Receiving Environment

8.3.1 Hydrology

This section describes the surface water features in the area and those which are potentially relevant to the assessment. A WFD assessment report for the Proposed Development is presented in Appendix 8-2 and reports on the surface waterbodies identified within the study area.

8.3.1.1 Surface Waterbodies

Much of the Site and the northern section of the study area is located within the Upper Shannon 26F WFD catchment, whereas the south of the Site and the southern section of the study area is located within the Boyne 07 WFD Catchment. The north of the Site and the majority of the northern section of the study area is located within the Inny (Shannon)_SC_010 WFD sub-catchment and the Inny_020 WFD river sub-basin. The south of the Site and the majority of the southern section of the study area is located within the Deel (Raharney)_SC_010 WFD sub-catchment and the Lough Lene-Adeel Stream_010 WFD river sub-basin. A portion of the western section of the study area is located within the Inny (Shannon)_SC_020 WFD sub-catchment and the WFD Glore (Westmeath)_010 river sub-basin.

There are several lake waterbodies located throughout the study area, which are presented in Table 8-7. The nearest lakes to the Site are a series of lakes ca. 440m to the northwest of the Site and known as Togher Lough, Goohertys Lough, Bane North (Lough) and Bane South (Lough).

The lake waterbodies which are assessed under the WFD include all lake waterbodies with areal extents over 0.5km^2 or less than 0.5km^2 but located within a protected area. The lakes within the study area which are assessed under the WFD include Doo (Lough), Annagh-White Lough and Ben Lough. All other lakes within the study area are either too small to be included in the assessment or are not located within a protected area.

In the north of the study area, the Rathmea River is located ca. 430m north of the northern Site boundary and flows in a general east-to-west direction from Inishatinny Lough to Naneagh Lough. The Knockbrack 26 Stream is located ca. 1.7km north of the Site boundary and flows in a general west-to-east direction. Both rivers are part of the WFD Inny_020 river waterbody.

In the south of the study area, there are four unnamed streams located ca. 1.3km southwest of the Site boundary and flowing in a general southeast to northwest direction and connects Carrick Lough with Oldtown Lough, an unnamed lake, rusty Lough and the Annagh-White Lough. The Ballany Stream is located ca. 1.63 km south of the Site and flows in a general northeast to southwest direction and connects Ballany Lough with Ben Lough. These five streams are part of the Lough Lene-Adeel Stream_010 WFD river waterbody.

There are no canal waterbodies within the study area.

The surface waterbodies within the study area are summarised in Table 8-7 and presented in Figure 8-1 below.

There are no hydrological connections identified between any of these surface waterbodies and the Site.

Figure 8-1: Surface Waterbodies

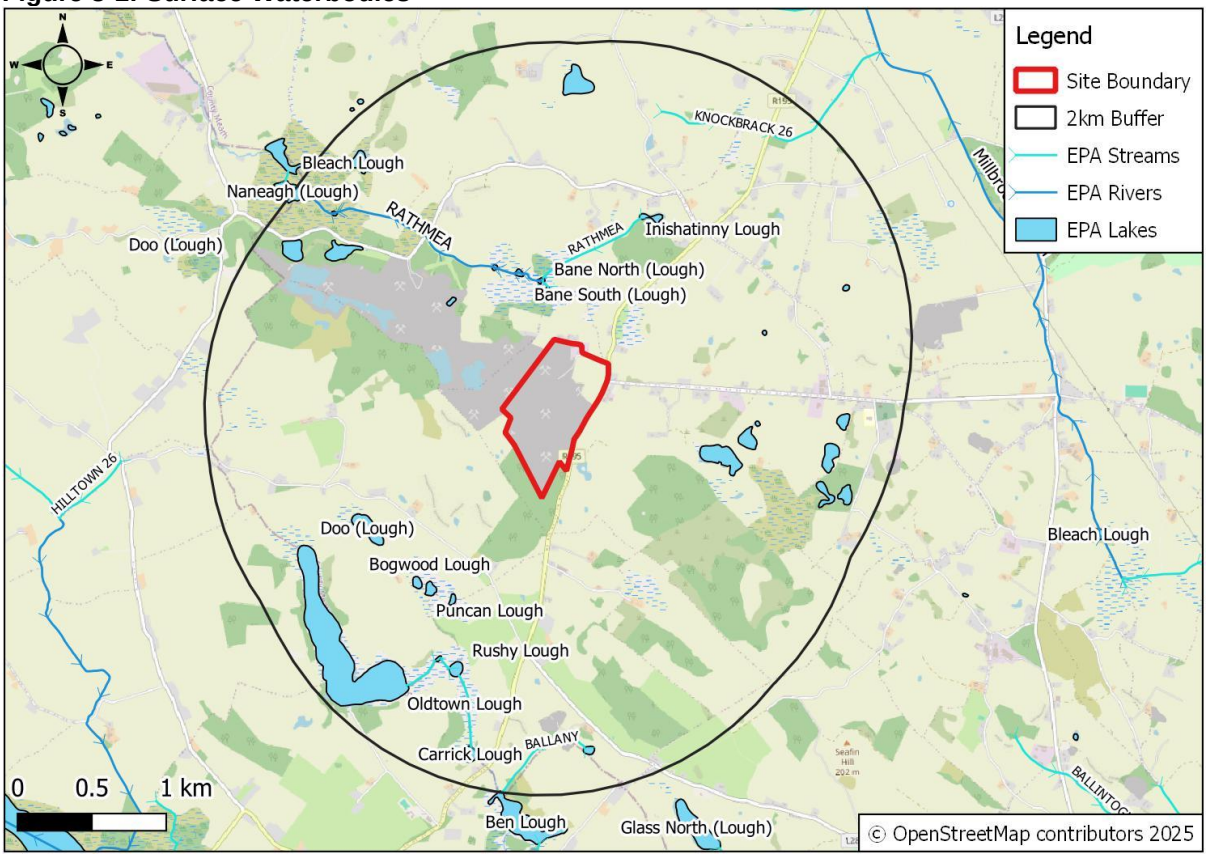


Table 8-6: Surface Waterbodies Within the Study Area

WFD Catchment	WFD Sub-Catchment	Waterbody Name	Waterbody Type
Upper Shannon (26F)	Inny (Shannon)_SC_010	Bane North (Lough)	Lake
		Bane South (Lough)	Lake
		Bleach Lough	Lake
		Deerpark Lough	Lake
		Goohertys Lough	Lake
		Inishatinny Lough	Lake
		Naneagh (Lough)	Lake
		Togher Lough	Lake
		14 No. unnamed lakes	Lake
		Inny_020	River
Boyne (07)	Deel (Raharney)_SC_010	Oldtown Lough	Lake
		Rushy Lough	Lake
		Annagh Lough or White Lough	Lake

WFD Catchment	WFD Sub-Catchment	Waterbody Name	Waterbody Type
		Ben Lough	Lake
		Ballany Lough	Lake
		Bogwood Lough	Lake
		Carrick Lough	Lake
		Doo (Lough)	Lake
		Puncan Lough	Lake
		2 No. unnamed lakes	Lake
		Lough Lene-Adeel Stream_010	River
	Inny (Shannon)_SC_020	No lake or river waterbodies within this sub-catchment are mapped within the study area.	

8.3.2 Hydrogeology

This section describes the groundwater features in the area and those which are potentially relevant to the assessment. A WFD assessment report for the Proposed Development is presented in Appendix 8-2 and reports on the groundwater bodies identified within the study area.

8.3.2.1 Bedrock Aquifer

The aquifer potential of a bedrock unit is determined by the potential groundwater yield of that unit, which in turn is determined based on hydraulic characteristics compiled from borehole data throughout the country. The GSI categorises the aquifer bodies into Regionally Important Aquifers, Locally Important Aquifers and Poor Aquifers. These are then subcategorised to create a total of ten bedrock aquifer categories and two sand and gravel aquifer categories.

According to the GSI database [9], the majority of the study area is underlain by a locally important bedrock aquifer – karstified ('Lk') which corresponds with the Derravaragh Cherts bedrock unit (Palaeozoic era, Carboniferous period, Mississippian subperiod). This bedrock aquifer lies within the Derravaragh groundwater body (refer to Section 8.3.2.6 for more information). Karstified aquifers are characterised by largely underground drainage with flow through permeable, interconnected conduit zones, high groundwater velocity and low aquifer storage. Karstified aquifers have strong interconnections between surface water and groundwater. According to the GSI database, there is a karst landform known as an enclosed depression along the northern boundary of the Site. This enclosed depression mapped within the Site can be clearly seen in the 2006 – 2012 satellite imagery. However, this area has since been reworked and undergone excavation in correspondence with extraction activities, and hence the feature was not observed during a site walkover. Bedrock was also not observed in this excavated area and so it is assumed that there was no connection between the mapped enclosed depression and the underlying bedrock aquifer.

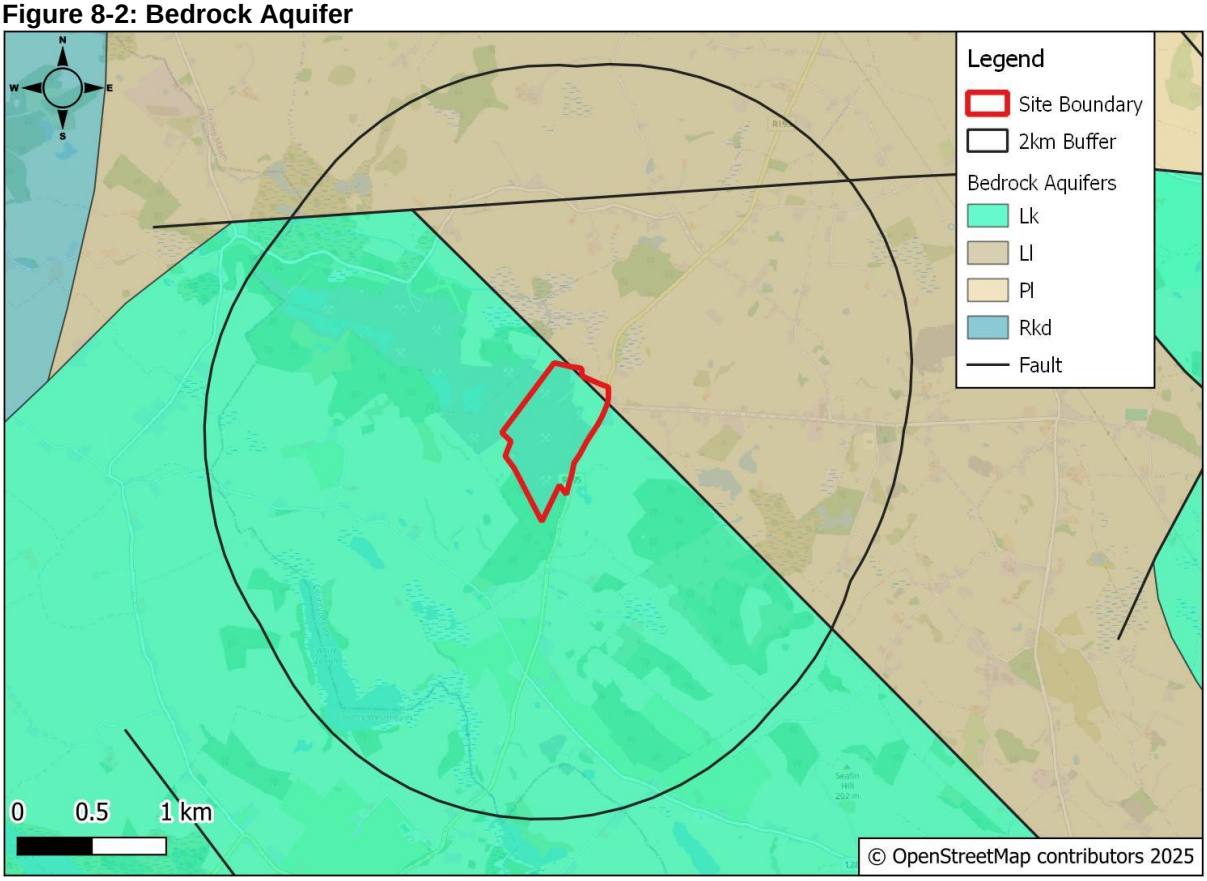
No karst features were identified in the immediate area of the Site during the site walkover. A review of the OSI 6" historic maps available in the GSI database identified wells and springs located within the study area; however, these were not observed during the site walkover. No springs or wells are recorded within the boundaries of the Site by the GSI, and no significant fractures or fissures were observed within the quarry faces.

There is a locally important aquifer – bedrock which is moderately productive only in local zones ('Ll') to the east and northeast of the Site. There is a sand and gravel aquifer ca. 3.2km northwest of the Site.

The bedrock aquifer map is presented in Figure 8-2 below.

To enable and assist the aquifer classification, bedrock formations and members were grouped into one of 27 rock unit groups which have similar properties and geological age. Both bedrock aquifers within the study area are part of the Dinantian Upper Impure Limestones rock unit group.

Figure 8-2: Bedrock Aquifer



8.3.2.2 Groundwater Vulnerability

Groundwater vulnerability represents the intrinsic geological and hydrogeological characteristics that determine how easily groundwater may be contaminated by activities at the surface. Groundwater vulnerability depends on the quantity of contaminants that can reach the groundwater and the time taken by water to infiltrate to the water table. These factors are controlled by the type of subsoils that overlie the groundwater, the way in which the contaminants enter the geological deposits (whether point or diffuse) and the unsaturated thickness of geological deposits from the point of contaminant discharge.

The groundwater vulnerability map is based on the type and thicknesses of subsoils (sands, gravels, glacial tills (or boulder clays), peat, lake and alluvial silts and clays) and the presence of karst features. Groundwater that readily and quickly receives water (and contaminants) from the land surface is more vulnerable than groundwater that receives water (and contaminants) more slowly and consequently in lower quantities.

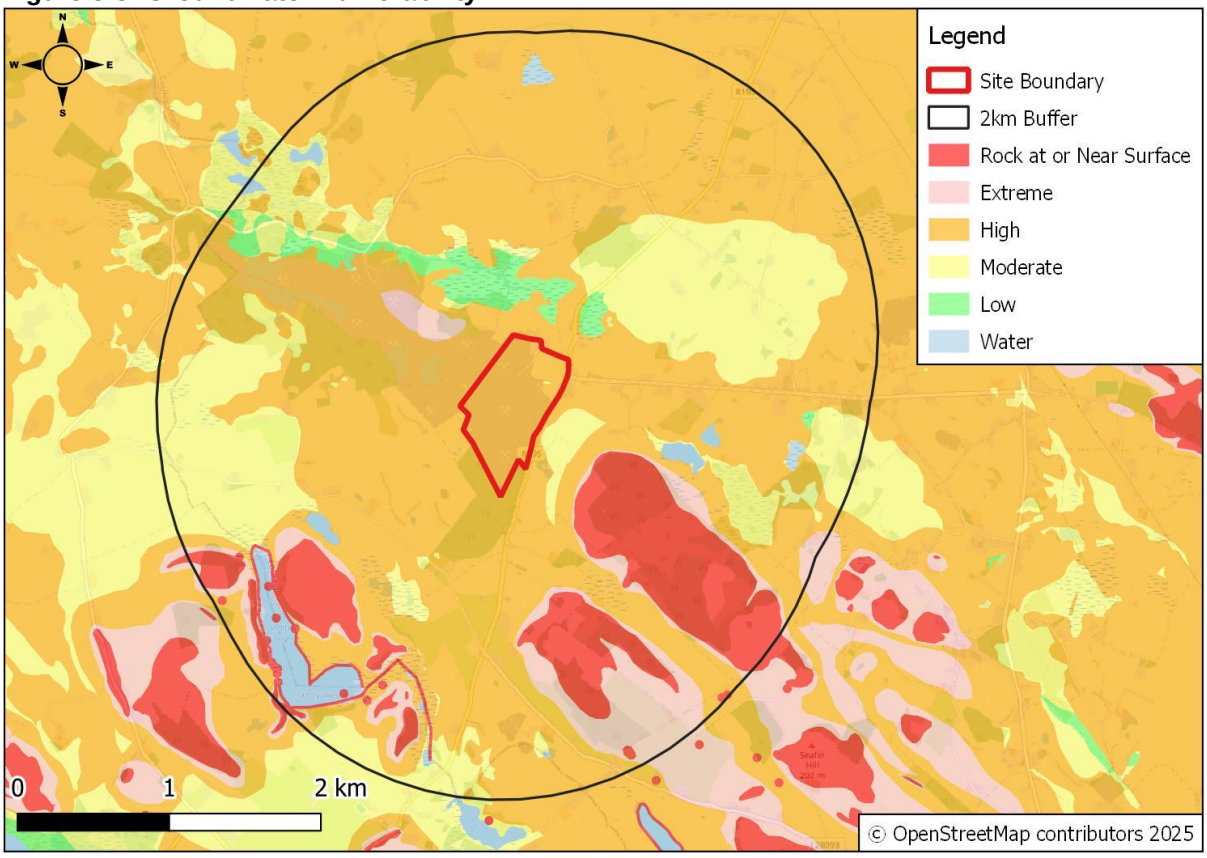
Groundwater is most at risk where the subsoils are absent or thin and in areas of karstic limestone, such as the Site. Because of the close interaction between surface water and

groundwater in karstified aquifers, any contamination of surface water would be rapidly transported into the groundwater system, and vice versa.

Based on the GSI maps [9], the entirety of the Site is classified as having High ('H') vulnerability. However, due to the excavation of the overlying soils and subsoils across the Site and the exposure of the bedrock in the east of the Site, the groundwater vulnerability may be considered to be at least 'Extreme' across the Site.

Groundwater vulnerability within the study area ranges from Low ('L') to the north of the Site to Rock at or Near Surface or Karst ('X') to the southwest and southeast of the Site. Groundwater vulnerability zones within the study area classified as having an 'X' vulnerability correlate to exposed or near surface bedrock as well as areas of karst. The zone of low groundwater vulnerability to the north of the Site directly correlates to a region of low permeability peaty soils. Refer to Figure 8-3 below.

Figure 8-3: Groundwater Vulnerability



8.3.2.3 Groundwater Protection and Use

As reported by the EPA and the GSI [10], groundwater sources, particularly public, group scheme and industrial supplies, are of critical importance in many regions. Consequently, the objective of a Source Protection Zone is to provide protection by placing tighter controls on activities within all or part of the source protection area of the supply. Groundwater Source Protection Zones ('SPZs') and Zones of Contribution ('ZOCs') are delineated areas which have been proven to contribute groundwater to a borehole or spring.

The Site is not within a Zone of Contribution / Source Protection Zone for any public or private water supplies, and there are no mapped group water schemes mapped close to the area.

The nearest protected area is the Ballymachugh Public Water Supply Source Protection Area as part of the County Cavan Groundwater Protection Scheme which is located ca. 15km to the northwest of the Site.

The GSI maintains a database of the registered wells and springs throughout the country. The database has a record of four potential abstraction points potentially located within 2km of the Site. These include one borehole and three dug wells which have reported yields ranging from 6.5 m^3/d to 44 m^3/d. The borehole is used for domestic use only.

A search of the GSI groundwater well database was conducted to identify registered wells within a 2km radius of the Site. There were no registered wells within 2km of the Site.

8.3.2.4 Groundwater Bodies

According to the EPA Maps [10] the Site is within the groundwater bodies of the Tynagh Gravels (IE_SH_G_238) and the Derravarragh GWB (IE_SH_G_077). The Tynagh Gravels GWB corresponds to the gravel deposits within the study area and the Derravarragh GWB corresponds to the underlying bedrock units. Refer to Figure 8-4 below.

The Tynagh Gravels GWB is assigned a "Good" status under the WFD 2016-2021 monitoring round [11]. The groundwater body risk is currently considered "at risk" of failing to meet the WFD objectives i.e. to achieve and maintain at least 'good' quality status by 2027. There is no GWB description available for this GWB from the GSI.

The Derravarragh GWB is classified as having "Good" status under the WFD 2016-2021 monitoring round and considered "at risk" of failing to meet the WFD. The GWB description available from the GSI describes the groundwater flow in the bedrock to be confined to the top 30m of highly weathered layers several meters thick overlying a zone of interconnected fissures. Subsoil thickness is variable above the GWB ranging from no cover at exposed bedrock outcrops to 64m thickness. The GWB is recharged mainly through point recharge mechanisms through karstified features such as swallow holes, and through diffuse recharge mechanisms such as rainfall percolation. Discharge from the GWB is to surface water features such as small springs. Groundwater flow paths are of local scale with some areas having underground connections for flow rates up to 80 m/hr. Flow paths have been documented to cross catchment and river basin boundaries, demonstrating that flow does not always follow the surface water catchment.

Within the study area, the Inny groundwater body (EU Code: IE_SH_G_110), the Ballymanus (EU Code: IE_SH_G_035) and the Athboy (EU Code: IE_SH_G_001) which comprise the Derravarragh Cherts (as part of the Upper Lucan Formation), the Lucan Formation, and the Visean Limestone Formation respectively. The Inny groundwater body and Athy groundwater body is classified as poorly productive bedrock of local importance while the Ballymanus groundwater body is classified as a Locally Important karstic Aquifer

The GSI groundwater body description for the Inny groundwater body [16] describes it as having generally low transmissivities of 2-20m^2/day, with transmissivity expected to be on the lower end of the scale. Diffuse recharge occurs through rainfall percolating through subsoils. Groundwater flow paths are focused in weathered and fractured zones of faulted bedrock and are in general between 30 and 300m. A majority of flow occurs in the upper tens of meters of bedrock, recharging and discharging in local zones. The low permeability rocks of this groundwater body will will not accept flow from the enclosed karstic Ballymanus groundwater body and the Derravarragh groundwater body.

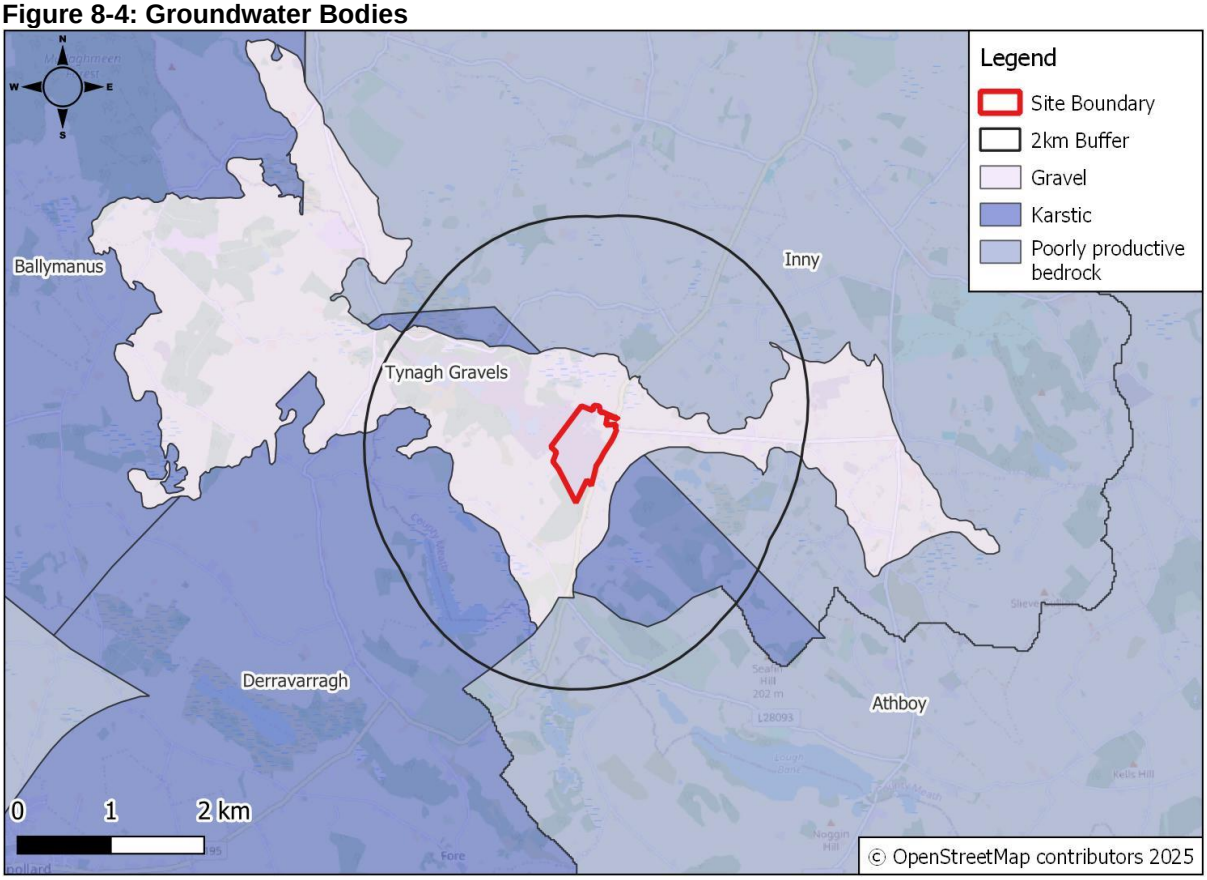
The GSI groundwater body description for the Ballymanus groundwater body [16], describes it as having varying transmissivities and groundwater flow into highly fractured and permeable bedrock. Diffuse recharge to the groundwater body occurs through percolation of rainwater in subsoils with the recharge rate varying based on local subsoil thickness. Groundwater is generally unconfined within the groundwater body.

The GSI groundwater body description for the Athboy groundwater body [16], describes it as having an average transmissivity of 50m^2/day, though higher have been reported. Diffuse recharge is the dominant source of recharge for the groundwater body determined by subsoil

thickness and topography. Some areas of the aquifer are disjointed and karstic – likely where point recharge occurs. Groundwater is generally unconfined within the groundwater body with flow taking place in the upper 3-5 meters of bedrock.

The Inny groundwater body, Ballymanus groundwater body and the Athboy groundwater body are classified as having 'good' water quality status and considered to be 'not at risk' of not meeting the WFD objectives.

Figure 8-4: Groundwater Bodies



8.3.3 Flood Risk Assessment ('FRA')

The OPW provides information on flood risk throughout Ireland. This includes historical events as well as modelled flood extents for:

- Low probability events i.e., 1-in-1000 chance of occurring or being exceeded in any given year, also known as an Annual Exceedance Probability ('AEP') of 0.1%;
- Medium probability events i.e., 1-in-a-100 chance of occurring or being exceeded in any given year, or an AEP of 1%; and,
- High probability events i.e., 1-in-a-10 chance of occurring or being exceeded in any given year, or an AEP of 10%.

The OPW also produce 'Flood Maps' (surface water) to comply with the requirements of the European Communities (Assessment and Management of Flood Risks) Regulations 2010 to 2015 (implementing Directive 2007/60/EC) for the purposes of establishing a framework for the assessment and management of flood risks. These aim to reduce the adverse consequences for human health, the environment, cultural heritage and economic activity associated with floods.

The Catchment-based Flood Risk Assessment and Management ('CFRAM') programme [12], was a point-in-time study to identify and map the existing and potential future flood hazards

and flood risks in the areas at potentially significant risk from flooding. The National Indicative Fluvial Mapping ('NIFM') model produced data for catchments greater than 5 km^2 in areas for which flood maps were not produced under the CFRAM programme. The modelled data is for the present-day scenario and does not take climate change into account.

The GSI has also developed Groundwater Flood Maps as part of the 2016-2019 Groundwater Flood Project in collaboration with Trinity College Dublin ('TCD') and the Institute of Technology Carlow ('IT Carlow'). These maps aid in understanding the deficit of groundwater flood data in Ireland and help to assist stakeholders making informed decisions regarding groundwater risk. Groundwater floods occur when the water stored beneath the ground rises above the land surface.

The Groundwater Flood Probability Maps shows the probabilistic flood extent of groundwater flooding in limestone regions. These maps are focussed primarily (but not entirely) on flooding at seasonally flooded wetlands known as turloughs. It should be noted that the predictive maps are limited to locations where the flood pattern was detectable and capable of being hydrologically modelled to a sufficient level of confidence.

The Winter 2015/2016 Surface Water Flooding map shows fluvial (rivers) and pluvial (rain) floods, excluding urban areas, during the winter 2015/2016 flood event, and was developed as a by-product of the historic groundwater flood map.

8.3.3.1 Surface Water Flooding

A review of these datasets did not show any areas in immediate proximity to the study area which are modelled to be liable to flooding.

A potential flood area from a fluvial flooding event was identified from the NIFM dataset and includes a section of the Inny_020 river waterbody (along the Knockbrack 26) to the north of the Site. This area is identified as having a low to medium probability of fluvial flooding.

The GSI Winter 2015/2016 Surface Water Flooding map shows several small, isolated areas of flooding throughout the study area, which correspond to lakes and marshy areas.

No recurring flood incidents were identified at the Site or within the study area.

8.3.3.2 Groundwater Flooding

The GSI Groundwater Flood Probability Map [9] shows an area around an unnamed lake located ca. 1.8km north of the Site and the area around the Annagh-White Lough, Rushy Lough, Oldtown Lough and Carrick Lough, which are modelled to have a low to high probability of groundwater flooding.

8.3.4 Designated Ecological Sites

The Site has two Special Areas of Conservation ('SAC') within a 2km vicinity. White Lough, Ben Loughs and Lough Doo SAC (Code: 001810) is located ca. 0.8km south of the Site and Lough Bane and Lough Glass SAC (Code: 002120) is ca. 2km southeast of the Site. There are no Special Protection Areas ('SPA') within 2km of the Site, the closest of which is Lough Sheelin SPA (Code: 004065), ca. 9.9km northwest of the Site. Further discussion of the ecological sites in the vicinity of the Site can be found in Chapter 6 of this EIAR.

The groundwater flow measurements collected between January 2025 and March 2025 identified groundwater flow in the underlying bedrock to be in a general south-to-north direction away from these ecological sites. Therefore, under the SPR model, there is no hydrogeological pathway or connection between the Site (source) and these ecological sites (receptors). Refer to Section 8.3.5.2 for more information.

8.3.5 Site Specific Environmental Setting

8.3.5.1 Site Water Use

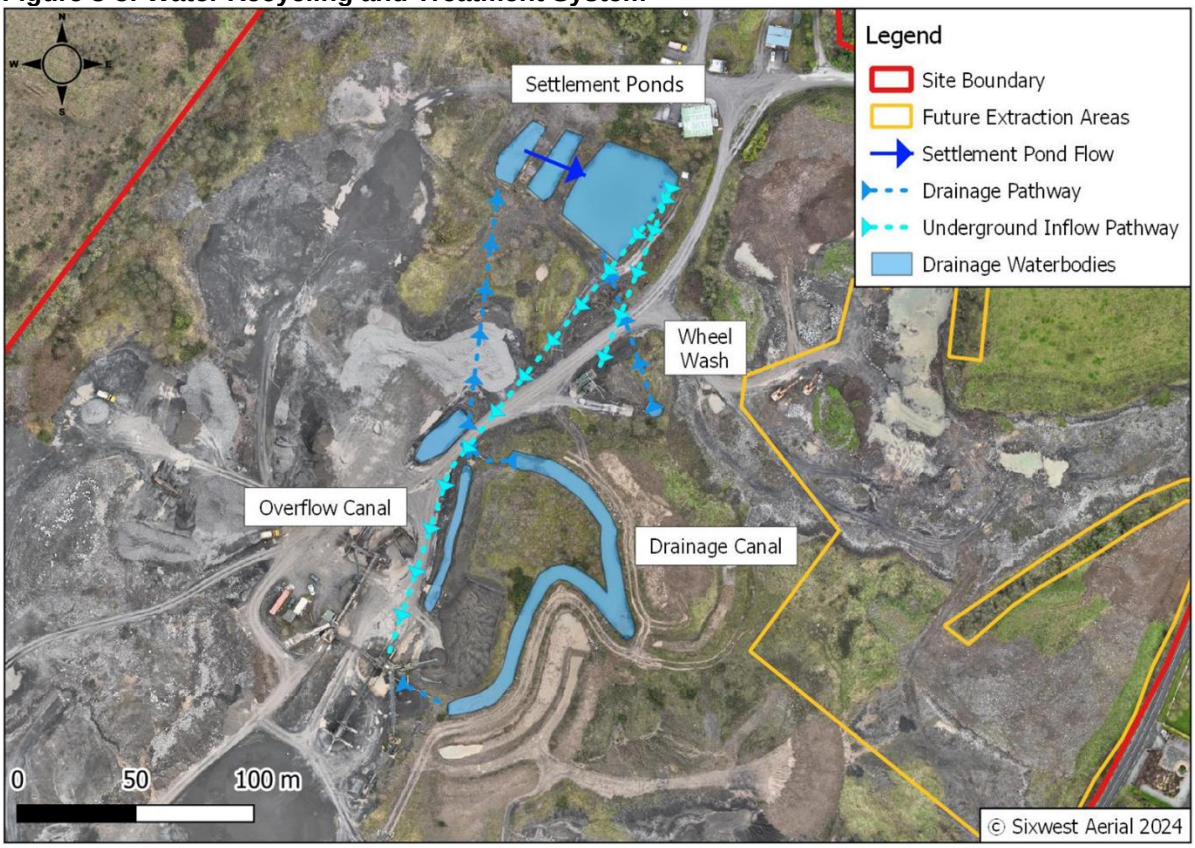
Water Recycling and Treatment System

The water used for processing on the Site is part of a water recycling system and is retained entirely within the Site. There are no discharges off-Site associated with the existing quarry and this system will remain operational for the Proposed Development. Three settlement ponds and a settlement canal are located within the north-central area of the Site and are part of the water treatment system implemented on the Site.

Water is pumped from the settlement ponds to the washing plant in the centre of the Site. Sediment-laden water from the plant is directed into the settlement canal. The settlement canal slowly flows by gravity in a winding manner which allows for the settlement of fines out of suspension. The water continues to flow by gravity to the settlement ponds via an underground pipe. These settlement ponds allow for more sediment to fall out of suspension and settle before the water is recycled and pumped back to the washing plant.

Refer to Figure 8-9 below for reference on the positioning of the settlement canal and the settlement ponds on the Site.

Figure 8-5: Water Recycling and Treatment System



***Note:** Underground inflow and drainage pathways are inferred and do not represent the actual locations of pipes or flow.

Drainage Water

Surface water run-off from quarry processes, including the wheel wash and screening plant, is collected in the onsite canal settlement system and settlement ponds located in the centre and the northern section of the Site.

Pools of water are present in low elevation areas throughout the Site and are reflective of surface water ponding from runoff around the Site. These surface water ponds are biologically diverse (refer to Chapter 6 for more information) and gradually infiltrate to ground during dry periods.

Wastewater

Wastewater for onsite amenities (kitchen, toilets, sinks, etc.) is treated privately onsite. The wastewater is collected through a wastewater pipeline network and directed toward a septic tank and percolation area in the north of the Site. No changes are proposed to this system.

Potable Water

Potable water used for office facilities, including faucets and toilet facilities, is obtained from a small onsite well in the northern section of the Site. No changes are proposed to this system.

8.3.5.2 Groundwater Levels and Flow Direction

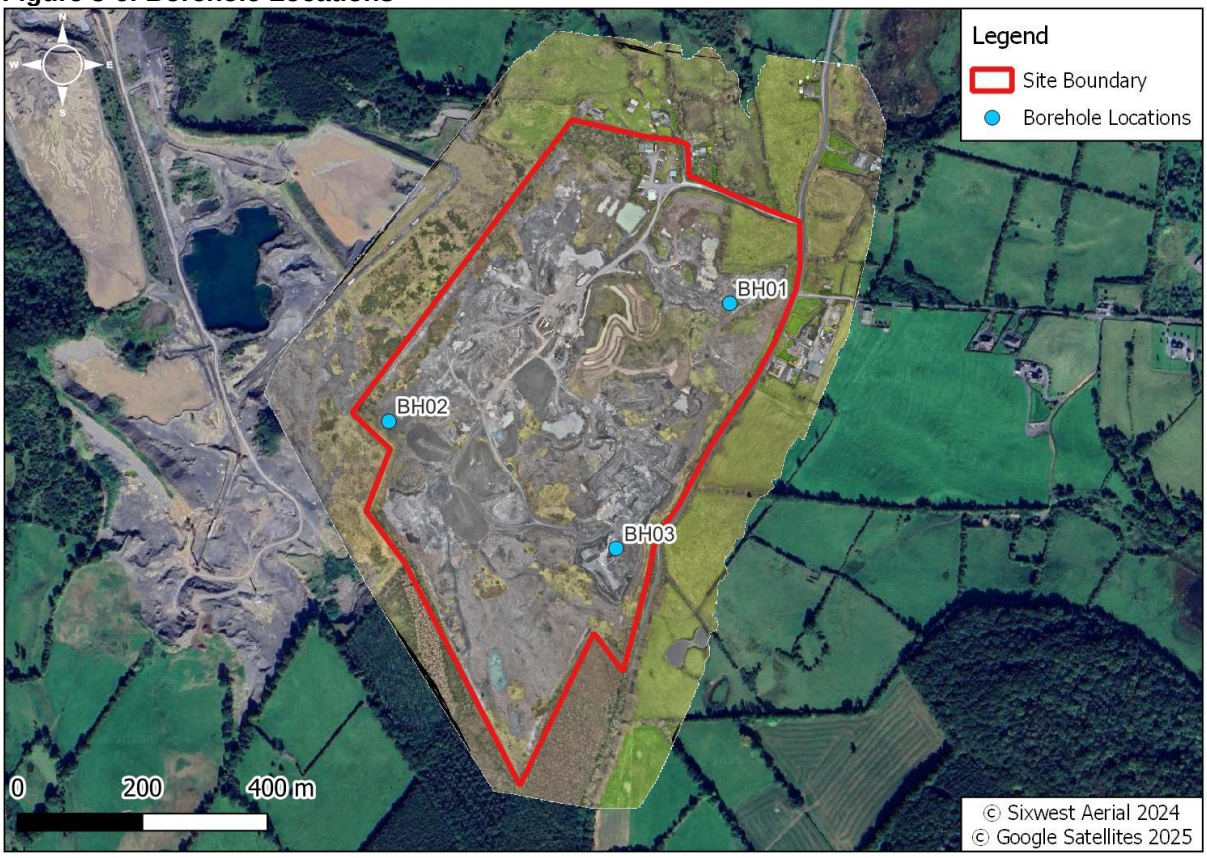
Groundwater levels were monitored in the bedrock aquifer underlying the Site to determine the groundwater flow regime.

Groundwater levels across the Site during the monitoring period January 2025 to March 2025, typically varied between approximately 118.21mAOD at BH01 and 122.83mAOD at BH02. Groundwater levels in each borehole were measured above the screened section of the borehole, which indicates confining conditions within the bedrock aquifer and groundwater under pressure. As such, the groundwater levels measured are reflective of the potentiometric surface of the bedrock aquifer underlying the Site.

The potentiometric surface in BH03 was measured at the top of the borehole casing above ground level in three out of the four monitoring events, hence BH03 is considered to be artesian. It is noted that BH03 is located within the existing limestone quarry area of the Site at an elevation of 118.58 mOD. The excavation depth for the Proposed Development is 119 mOD and hence artesian conditions are not expected to be encountered at any stage of the Proposed Development.

Monitoring well locations are shown in Figure 8-5 below and as presented in the Causeway Geotech report in Appendix 7-1 of this EIAR. Groundwater levels measured in the newly installed groundwater monitoring wells (BH01, BH02 and BH03) are shown in Table 8-7 below.

Figure 8-6: Borehole Locations



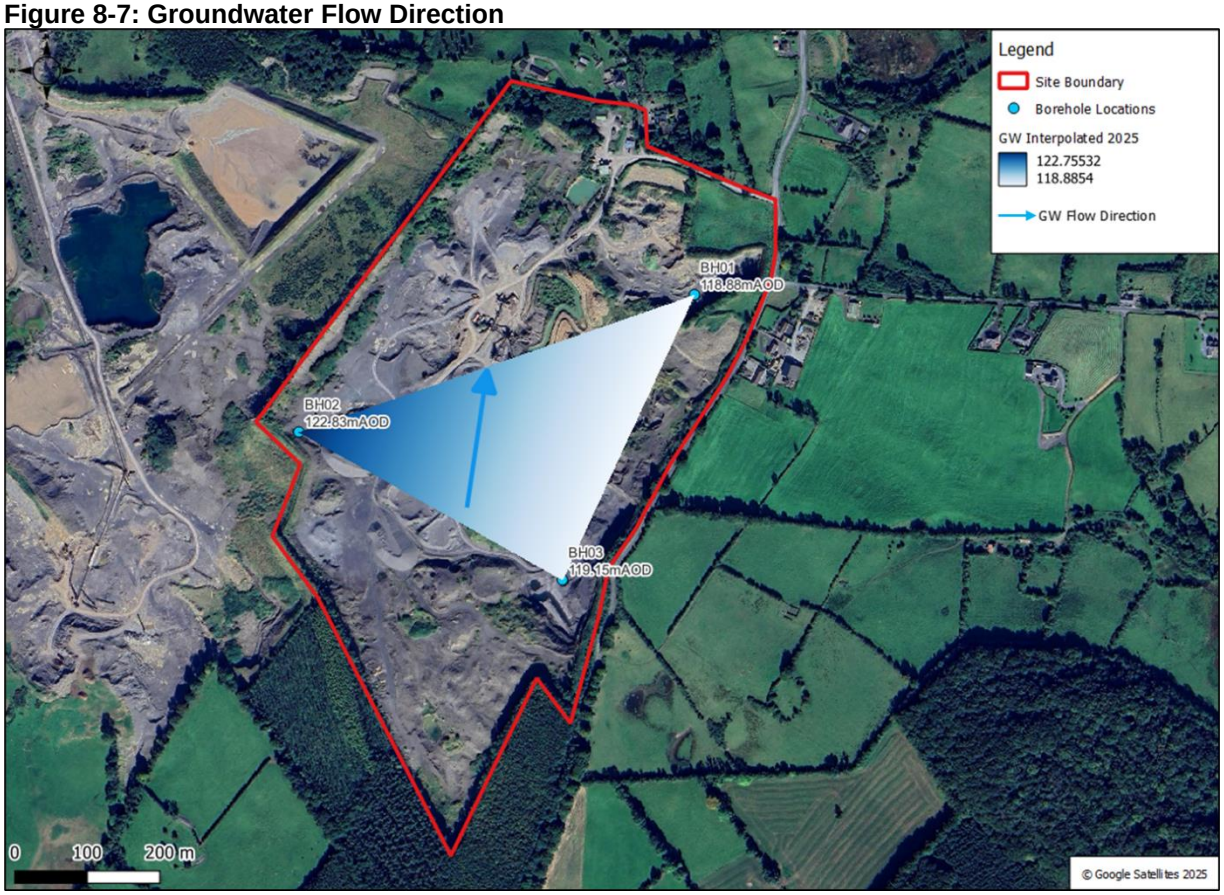
Based on water levels collected during the 2025 monitoring events, it is concluded that groundwater flows in a general south to north direction across the Site. The change in bedrock aquifer in the north of the Site may act as a barrier to groundwater flow to surface water features located to the north of the Site. Therefore, it is concluded that groundwater underneath the Site is not contributing to baseflow in surface water features within the study area and that there is no hydrogeological connection between groundwater underneath the Site and surface water within the study area. Figure 8-6 below shows groundwater flow direction.

Table 8-7: Site Groundwater Level Measurements

Well ID	Elevation Reference*	Total Depth	27/01/2025		04/02/2025		04/03/2025		19/03/2025	
	mAOD	mbtoc	mbtoc	mAOD	mbtoc	mAOD	mbtoc	mAOD	mbtoc	mAOD
BH01	120.88	12.52	2.67	118.21	2.51	118.37	2.52	118.36	2.0	118.88
BH02	129.17	20.52	6.42	122.75	6.34	122.83	6.64	122.53	7.1	122.07
BH03	119.15	10.57	0.21	118.94	0*	119.15	0*	119.15	0*	119.15

Notes:
*Elevation reference is top of casing
0* denotes an artesian well i.e. groundwater piezometric surface level is above ground level.
mAOD: Meters above ordnance datum. mbtoc: Meters below top of casing.

Figure 8-7: Groundwater Flow Direction



8.3.5.3 Groundwater Quality

No historic groundwater monitoring data was available for the Site. Groundwater sampling for BH01, BH02 and BH03 was carried out on the 27th January 2025 by a MOR Environmental geologist. Samples collected were sent to Element Ltd, a UKAS and ISO 17025 accredited laboratory for analysis. The samples were kept cool and in darkness while in transit. In order to maintain sample integrity, a Chain of Custody ('CoC') document was completed to track sample possession from the time of sample collection to the time of analysis.

Sample results were compared to Groundwater Regulations 2010 (S.I. No. 9 of 2010) as amended (S.I. No. 389 of 2011, S.I. No. 149 of 2012, S.I. No. 366 of 2016, S.I. No. 287 of 2022) [17] and the Drinking Water Regulations S.I. No. 99 of 2023 [18].

Groundwater samples were tested for the following parameters:

- Physical parameters such as electrical conductivity ('EC') and pH;
- Chemical parameters such as organics, inorganics and dissolved metals;
- Polyaromatic Hydrocarbons ('PAHs'); and,
- Pesticides.

There were no exceedances of groundwater and drinking water General Assessment Criteria ('GAC') from the samples taken at BH01, BH02 and BH03 during the January 2025 monitoring event. Results from the laboratory can be found within Appendix 8-1 of this report.

8.4 Conceptual Site Model

The conceptual site model ('CSM') relating to the hydrological (surface water) and hydrogeological (groundwater) environment for the Murrens Quarry and study area was

developed based on the information presented in Chapter 3 of this EIAR, information collected from the desk study and site-specific surveys as presented in Section 7.3 of Chapter 7 of this EIAR and presented in Section 8.3 above.

In summary, the Site is located within different WFD catchments, sub-catchments and river basins, with a general divide in the north and south of the Site and within the Tynagh Gravels and the Derravarragh groundwater bodies. No hydrological or hydrogeological pathway was identified between the Site (source) and the surface water features (receptors) within the study area. Therefore, under the SPR model, there is no connection between the Site and these surface water features.

The Site overlies a locally important aquifer – karstified ('Lk') bedrock aquifer, and the general area is classified as having high groundwater vulnerability. However, due to the nature of the extraction activities, the groundwater vulnerability rating may be considered to be at least extreme ('E').

Groundwater level monitoring determined that groundwater flow across the Site is generally in a south to north direction and hence flows away from the protected ecological sites located to the south of the study area (i.e. the White Lough, Ben Loughs and Lough Doo SAC and the Lough Bane and Lough Glass SAC). Therefore, there is no hydrogeological connection between the Site and these protected ecological sites.

Results of groundwater quality sampling determined that the water underneath the Site is of good quality, which is in line with the WFD 'good' quality status assigned to the Derravarragh groundwater body.

A visual representation of the CSM is depicted in Figure 8-8 below and the cross-section location of the CSM is shown in Figure 8-7 below. The CSM covers the Proposed Development Site and extends to the White Lough, Ben Lough and Lough Doo SAC. As shown in the CSM presented in Figure 8-8, there is a topographic high point between the Murrens Quarry Site and the SAC which acts as a local groundwater divide such that groundwater to the north of this topographical high point flows in a general south to north direction, and groundwater south of this topographical high point flows in a general north to south direction.

Figure 8-8: Conceptual Site Model

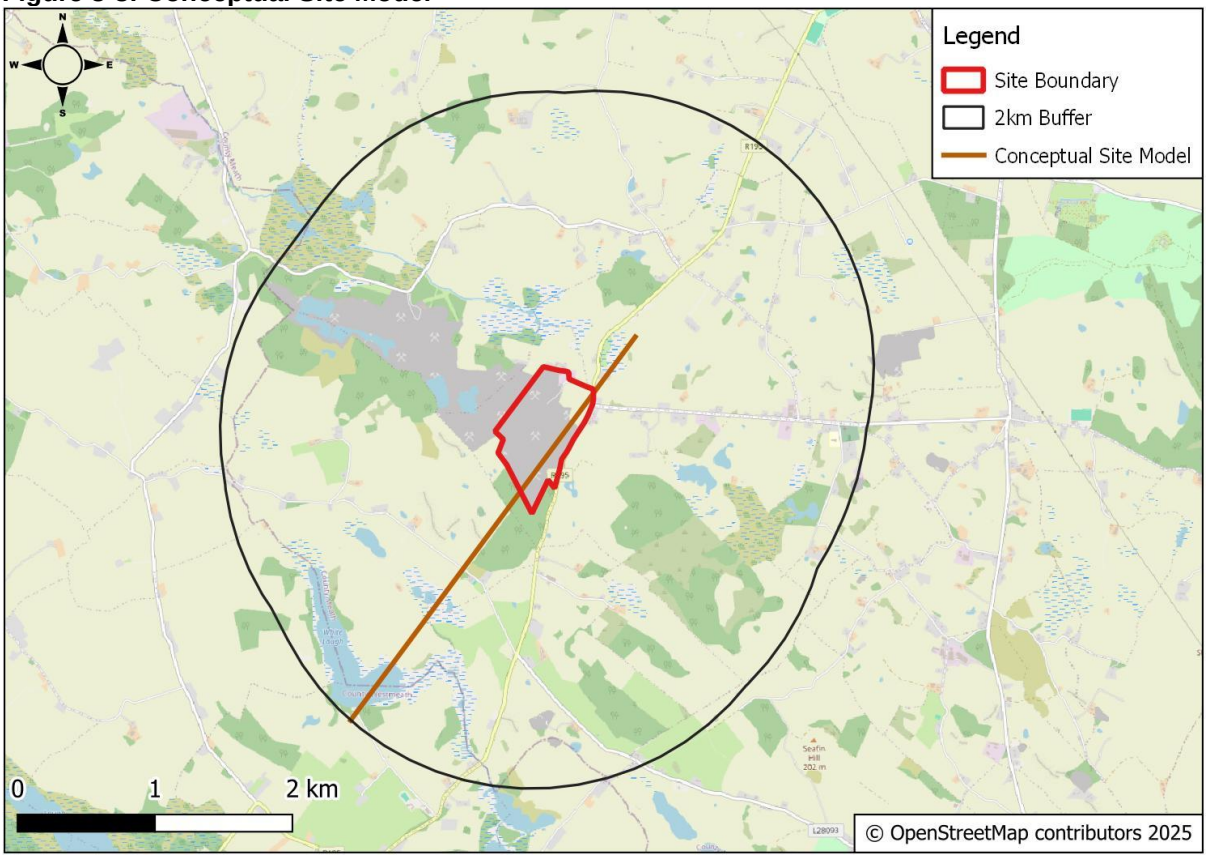
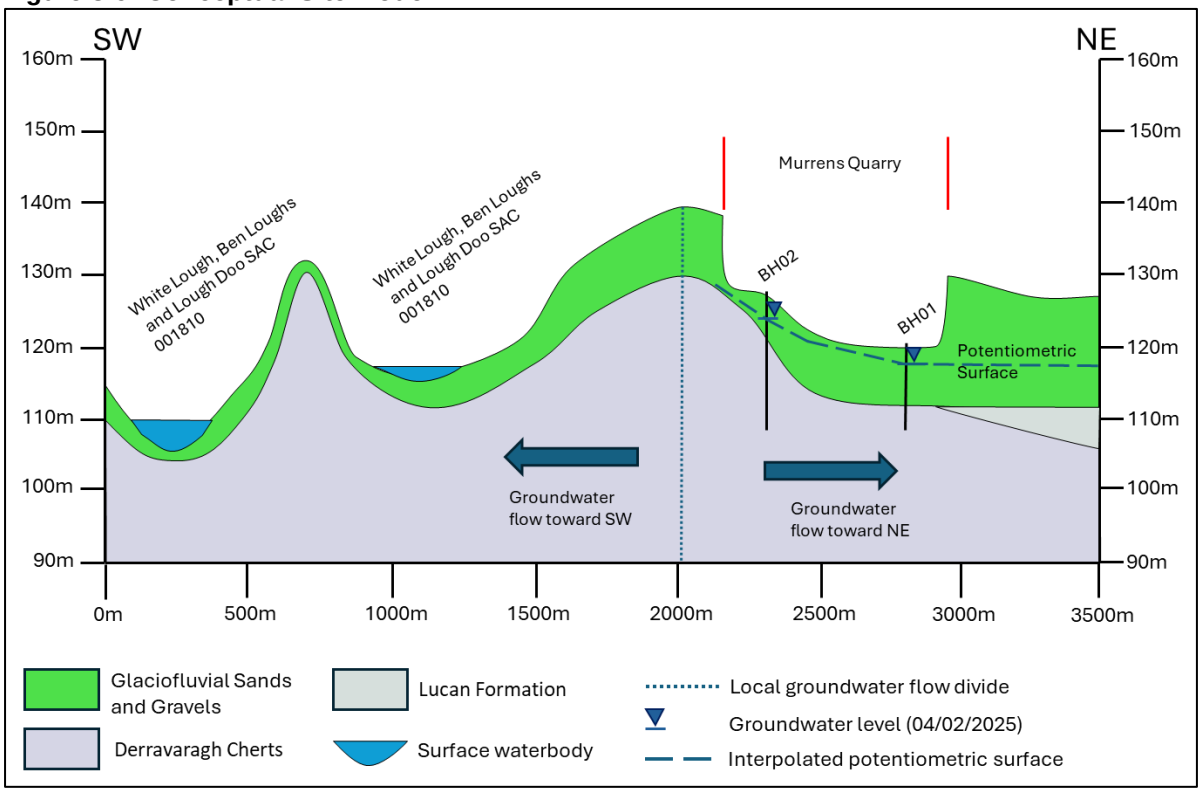


Figure 8-9: Conceptual Site Model



8.5 Characteristics & Impact of Development

In the absence of a hydrological connection between the Site and any nearby surface waterbodies, there are no effects on the hydrological environment identified as a result of the Proposed Development.

The characteristics and potential impacts of the Proposed Development have been identified as follows:

- The impact on the bedrock aquifer underneath the Site from the Proposed Development;
- The impact on the groundwater underneath the Site from the Proposed Development; and,
- The release of pollutants from plant and equipment into groundwater.

The Proposed Development will entail the removal of soils and the excavation of subsoils and bedrock within two main areas of the existing quarry (i.e. Extraction Area A and Extraction Area B), extraction and aggregate screening processes, loading and maintenance of transport vehicles and mechanical equipment, as well as ongoing and future remediation measures within the Site boundaries.

This will involve three distinct stages/ phases in relation to water:

- Stage 1 (pond reconstruction and Site preparation), comprising:
    - The creation of two new ponds and the restoration of existing quarry habitat to a low nutrient landscape.
- Stage 2 (extension and levelling of quarry floor in the north of Site, deepening and levelling of quarry floor in the east of Site and stockpile removal), comprising:
    - Removal of bedrock aggregate within a 23,892m2 area (Extraction Area A) in the eastern section of the Site to a uniform elevation of 119mOD;
    - Excavation of sand and gravel aggregate within a 39,639m3 area (Extraction Area B) in the northeastern section of the Site to a uniform elevation of 119mOD; and,
    - Removal of existing stockpiles within the quarry.
- Stage 3 (immediate reinstatement/ remediation and future reinstatement/ remediation), comprising:
    - The shutoff of pumps that pump water from the settlement canal to the washing plant; and,
    - Maintenance and use of stockpiles soils from Stage 2, including spreading thin layers of soils across areas of the Site for reinstatement.

These three stages have been dealt with separately as the effects associated with each are distinct.

8.5.1 Stage 1 (Pond Reconstruction and Site Preparation)

There are no expected changes to water usage and/ or future developments for water activities during Stage 1. Works on Site may have the potential to impact groundwater through potential contamination events.

In order to carry out the works at the Proposed Development during Stage 1, heavy machinery, vehicles and equipment vehicles will be required. As such, fuels and hydrocarbons used to power these will pose a risk to groundwater should a potential contamination event such as a

spill or leakage occur. The bedrock aquifer is a locally important aquifer and therefore is considered to be of medium sensitivity. The maximum volume of fuel/ hydrocarbon which could infiltrate into the ground will be limited by the volume of the storage tank on Site. In order for the fuel/ hydrocarbon to reach the bedrock aquifer, it would have to infiltrate through the overlying fluvioglacial sands and gravels before reaching the bedrock aquifer. In the absence of mitigation, the magnitude of the impact would result in a medium adverse impact on the integrity of the bedrock aquifer. This would then result in a negative, moderate effect on the bedrock aquifer.

Mitigation measures listed in Section 8.6 will reduce the risk of contamination events from occurring and will therefore reduce the identified effect should such an event occur.

8.5.2 Stage 2 (Extension and Levelling of Quarry Floor in the North of Site, Deepening and Levelling of Quarry Floor in the East of Site and Stockpile Removal)

There are no expected changes to water usage and/ or future developments for water activities during Stage 2. Works on Site may have the potential to effect groundwater through potential contamination effects, a potential increase in the groundwater vulnerability classification and removal of part of the bedrock aquifer.

The Stage 1 works to remove sand, gravel and bedrock aggregate from proposed areas of further extraction during the Proposed Development may locally increase the groundwater vulnerability classification from ‘high’ to at least ‘extreme’. The removal of overlying sand and gravel in the northeast of the Site will remove several meters of material which would otherwise hinder potential contaminants from reaching the bedrock aquifer. The removal of bedrock aggregate in the east of the Site will remove several meters of the unsaturated zone of the bedrock aquifer, thereby reducing the thickness of bedrock which potential contaminants would have to infiltrate through to reach the groundwater. The bedrock aquifer is considered to be an attribute of medium sensitivity, and the impact in this instance would result in a localised, higher risk of contamination to the bedrock aquifer. In the absence of mitigation, it is noted that the maximum volume of potential contaminant would be limited to the size of the tanks on machinery operating within the proposed future extraction areas. Therefore, the magnitude of this impact is considered to be small adverse and would result in a permanent, localised, slight effect.

The removal of bedrock aggregate will result in the removal of a small portion of the unsaturated zone of the bedrock aquifer. This change to the bedrock aquifer will not result in any change to water supplies, river baseflows or ecosystems. Therefore, the magnitude of the impact is considered to be small, adverse and will result in a permanent, localised, slight effect.

There are no changes to drainage water, wastewater and potable water sources and uses during Stage 2 of the Proposed Development.

8.5.3 Stage 3 (immediate reinstatement/ remediation and future reinstatement / remediation)

Stage 3 water requirements will be minimal compared to the Stage 2 works. Where works overlap with Stage 2, no change in general water use is expected. However, during the final stages of Stage 3 and the overall restoration of the Site, the onsite washing plant will be dismantled, and the use of water onsite will be stopped. The pipe network for the drainage water system is proposed to be removed in concurrence with the dismantling and removal of the plant. Submersible pumps that feed the screening plant and the wheel wash in the centre of the Site will be shut off and removed as part of the plan for reinstatement.

Removal of the inflow and outflow mechanisms of water from the settlement pond and settlement canal will allow these water features to gradually transition to a natural state and promote aquatic flora and fauna to develop.

Therefore, the dismantling and removal of the equipment involved in the on-site water recycling system will result in a minor, permanent, positive effect on these water features.

During Stage 3, stockpiles of previously removed soils as well as imported, clean soils will be spread across areas of the quarry for levelling works. This in turn may provide some natural protection to the underlying bedrock aquifer. However, the thickness of soils spread across the Site is expected to be small and as such the effect will be positive but negligible.

8.5.4 Unplanned Events

As with all industrial facilities, there will be some risk that unplanned events at the Site which are typically outside of the operator control could result in a risk to the environment. Risks specific to water are identified in Table 8-8.

Table 8-8: Unplanned Events

Hazard	Likelihood(1)	Consequence(2)	Reasoning
Collision / accident involving delivery truck arriving at / departing from the Site resulting in the release of substances	2	3	Measures will include but are not limited to the following: • Speed limits and a traffic management system will be implemented onsite; • All transit areas will be paved; • Spills will be contained within the site drainage system which will contain an emergency shut off valve; • Operational procedures as part of the facility's Environmental Management System ('EMS') will be in place for incoming and outgoing materials; and, • An adequate supply of suitably absorbent materials will be kept on site to deal with any spills.
Fire - resulting in the emission of fire water	2	3	Measures will include but will not be limited to the following: • The facility will have an adequate fire prevention plan.
Spillage of hydrocarbons or chemicals	2	3	Measures will include but will not be limited to the following: • All relevant external storage of chemicals or liquids within bund-protected zones / containers; • Tanks and bunds will be impervious to the material they contain;

(1) Likelihood rating: 1-5 where 1 is very unlikely and 5 is very likely

(2) Consequence rating: 1-5 where 1 is Trivial and 5 is Massive

8.6 Mitigation Measures

The employment of good environmental management practices serves to minimise the risk of pollution from the extraction activities at the Quarry Site in line with the EPA (2006) Environmental Management Guidelines: Environmental Management in the Extractive Industry (Non-Scheduled Minerals) [8]. Mitigation measures for prevention of water

contamination during all stages of the quarry are stated below. The following measures should be adhered to:

- All plant and HGVs will be refuelled within the designated equipment maintenance area;
- All plant and HGVs will be refuelled utilising adequately sized and positioned drip trays;
- Spill kits will be available adjacent to all refuelling and fuel storage operations;
- Fuel will be stored in tanks in the existing quarry and will be appropriately bunded and maintained;
- Fuels, lubricants and hydraulic fluids for screening equipment used on the Site will be carefully handled to avoid spillage, properly secured against unauthorised access or vandalism, and provided with spill containment according to best practice codes;
- Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the Site for disposal or recycling;
- Drip trays will be used under plant which has the potential for hydrocarbon or chemical leakage when located on permeable ground;
- Any spillage of fuels, lubricants, hydraulic oils or other chemicals will be immediately contained, and the contaminated soil removed from the Site and disposed of in accordance with relevant legislation;
- Water will continue to be collected in the existing water recycling system i.e. the settlement canal and settlement pond, before re-use to allow solids to settle out.

8.7 Cumulative and In-combination Effects

There is potential for cumulative and in combination effects from the Site and surrounding developments.

A quarry operated by B.D. Flood Ltd is located adjacent to the northwest Site boundary. The facility extracts aggregate and stone and produces ready-mix concrete as well as concrete blocks. Any in-combination effects on the quality and quantity of groundwater in the area arising from works associated with the quarries were considered to be ‘not significant’, as monitoring results from the Site remain within set guidelines criteria.

No other cumulative or in-combination impacts are noted as likely to occur. Hence, any cumulative or in-combination effects on the water environment as a result of the Proposed Development are considered to be ‘negligible’.

8.8 Interactions with other Environmental Attributes

Water (Hydrogeology and Hydrology) interacts with other environmental attributes as follows:

- **Chapter 5 - Population and Human Health:** Potential impacts on human health can occur through the contamination of water used for abstraction. This assessment has indicated that the Proposed Development has an imperceptible effect on groundwater quality;
- **Chapter 6 - Biodiversity:** Potential impacts on hydrology can also impact on ecological conditions and ecologically designated sites. Impacts on biodiversity are assessed in detail in Chapter 6;
- **Chapter 7 - Land, Soils and Geology:** Impacts on soils / bedrock can result in related impacts on surface water and groundwater. Given that soils were removed onsite due to historical activities and the results of the groundwater beneath the site showed no

significant impact on the water quality or water quantity, the impact on soils/ bedrock was determined to be imperceptible. These impacts on the geological environment are discussed in Chapter 7; and,

- **Chapter 10 – Climate Change:** Climate change could lead to intense rainfall which could contribute to flooding. The potential effects associated with climate change on water have been fully considered.

8.9 Indirect Impacts

No indirect impacts were noted to have occurred as a result of the onsite works.

8.10 Residual Impact of the Site

The groundwater vulnerability classification is expected to increase from 'high' to at least 'extreme' within the proposed extraction areas. Additionally, the removal of bedrock aggregate will result in an impact on the unsaturated zone of the bedrock aquifer. However, both impacts are localised and considered to result in a slight effect on the hydrogeological environment.

The restoration stage of the Proposed Development will result in a positive effect on the water features and associated biodiversity within the Site.

8.11 Monitoring

No groundwater monitoring occurred as part of historical activities. Historical and recent groundwater monitoring is discussed above in Section 8.3.5.2.

8.12 Reinstatement

Stage 1 and Stage 3 of the Proposed Development outlines how the Site will be restored. These stages and potential associated effects have been considered throughout this Chapter.

As discussed throughout this chapter, reinstatement and restoration works will be implemented from Stage 1 of the Proposed Development – Site Preparation. The Site will continue to be subject to a Restoration Plan following the cessation of operations on-site with further details included in Section 6.7 of Chapter 6 of this EIAR.

8.13 Difficulties Encountered

There were no difficulties encountered in compiling this information.

8.14 References

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[4] Government of Ireland, “Water Action Plan 2024,” GoI, Dublin, 2024.

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[6] CIRIA, “C532 Control of Water Pollution from Construction Sites - Guidance for Consultants and Contractors,” Construction Industry Research and Information Association, London, 2001.

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[17] Government of Ireland, "European Union Environmental Objectives (Groundwater) Regulations (as amended)," Houses of the Oireachtas, Dublin, 2016.

[18] S. Instruments, "S.I. No. 99 of 2023 European Union (Drinking Water) Regulations 2023," European Union, 2023.

[19] EPA, "EPA Maps," EPA, 2025. [Online]. Available: https://gis.epa.ie/EPAMaps/. [Accessed 2025].

FIGURES

TABLES

9 AIR QUALITY

9.1 Introduction

This chapter of the EIAR provides a description and assessment of the likely effects of the Proposed Development on air quality in the vicinity of the Site.

This chapter assesses the effect of the Proposed Development on sensitive receptors in relation to human health and ecology, through the methodology presented in IAQM [1] guidance document and the Clean Air for Europe directives, and in relation to dust nuisance, through the methodology outlined in the TA Luft [2], EPA [3] and DEHLG [4].

9.2 Methodology

The following standards and guidance documents were used to determine the baseline conditions and assess the potential effects on air associated with the Proposed Development:

- Department of Environment, Heritage and Local Government ('DEHLG') – Quarries and Ancillary Activities: Guidelines for Planning Authorities (2004) [4];
- Institute of Air Quality Management ('IAQM') - Guidance on the Assessment of Mineral Dust Impacts for Planning [5];
- EPA - Environmental Management in the Extractive Industry (Non-Scheduled Minerals) (2006) [3];
- Irish Concrete Federation ('ICF') Environmental Code (2005) [6];
- EPA, Air Quality in Ireland 2022 – Indicators of Air Quality [7];
- EPA, Air Quality in Ireland 2023 – Indicators of Air Quality [8]; and,
- EPA, Air Dispersion Modelling from Industrial Installations Guidance (AG4) (2019) [9].

9.2.1 Policy / Legislative Context

The following sections review and highlight relevant policies and legislation relating to the Proposed Development in the context of national, regional and local air quality objectives.

9.2.1.1 Clean Air Strategy

The Department of Communications, Climate Action and Environment ('DCCAE') published the Clean Air Strategy for Ireland [10] in 2023, with the aim to reduce certain specific sources of emissions that are having the greatest impact, whilst also identifying cost-effective approaches to emission reductions [11].

The Clean Air Strategy sets out seven key strategic priorities relating to air quality in Ireland:

- To set the appropriate targets and limits to ensure continuous improvements in air quality across the country to deliver health benefits for all;
- To ensure the integration of clean air considerations into policy development across the Government;
- To increase the evidence base that will help us to continue to evolve our understanding of the sources of pollution and their impacts on health in order to address them more effectively;
- To enhance the regulation required to deliver improvements across all pollutants;
- To improve the effectiveness of our enforcement systems;
- To promote and increase awareness of the importance of clean air and the links between cleaner air and better health; and,

- To develop additional targeted / specific policy measures as required to deal with national or local air quality issues.

9.2.1.2 Meath County Council Development Plan 2021-2027

As outlined in the County Development Plan [12], Meath County Council's role in relation to air quality is to promote a reduction in air pollution through the implementation of relevant legislation and through the provision of advice and guidance on best practice for the management of air quality. Air pollution challenges include:

- Transport emissions, primarily from road transport (cars, buses and HGV's) rail, air and shipping;
- Industrial and agricultural emissions;
- Emissions from domestic burning of fossil fuels; and,
- Emissions from fire-house fires, gorse fires, and bog land fires which may result in localised poor air quality.

Meath County Council have a specific objective in the County Development Plan regarding air quality:

- INF OBJ 72 "To support the collation or air quality and greenhouse gas monitoring data in support of a regional air quality and greenhouse gas emission inventory."

9.2.2 Mineral Dust Risk Assessment

A risk assessment of dust emissions arising from activities associated with the Proposed Development was completed in accordance with IAQM [1] guidelines. A flow chart outlining the various steps associated with the preparation of a dust risk assessment are outlined in Figure 9-1, with further details presented in Appendix 9-1.

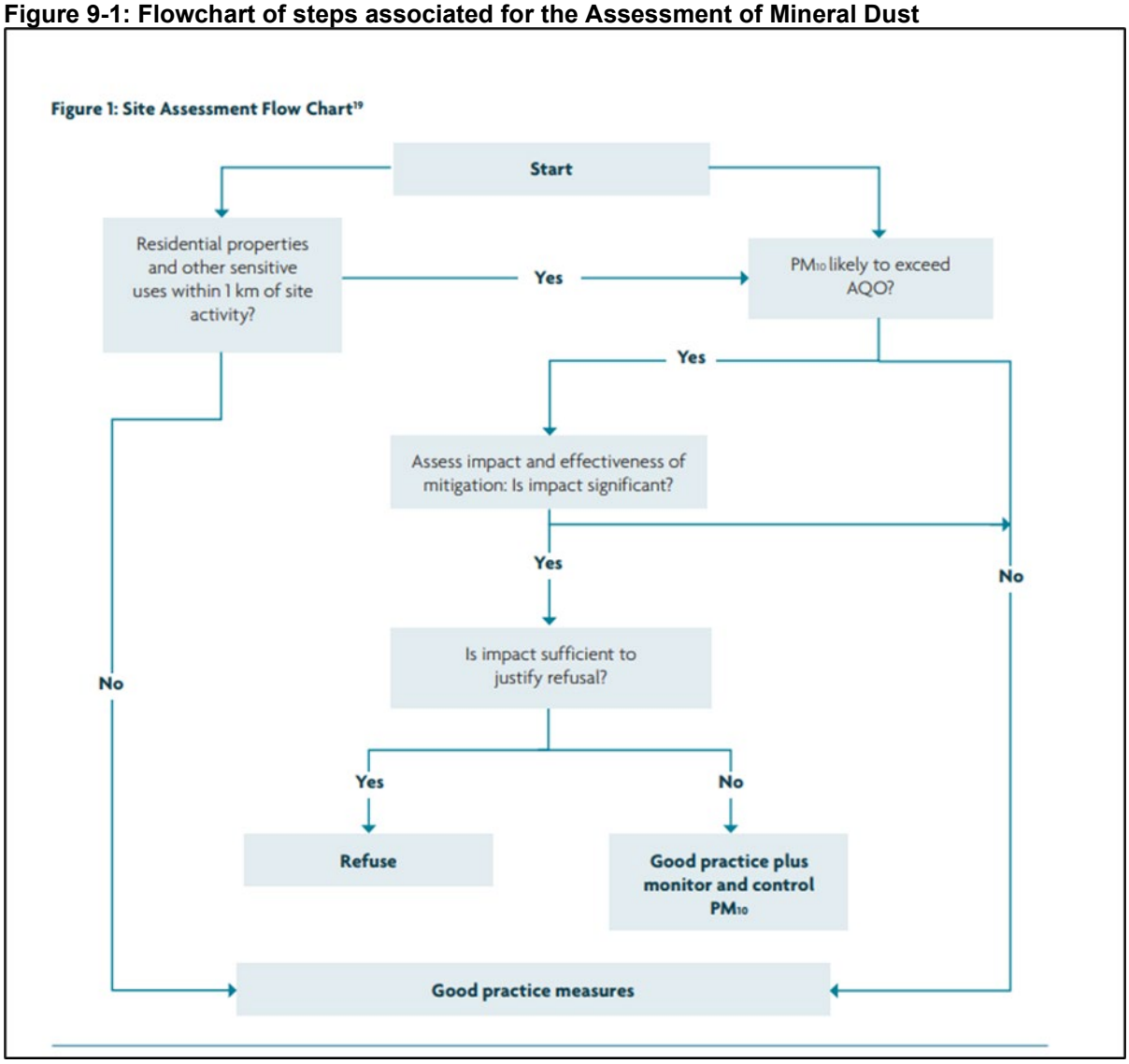
The definition of minerals in this chapter is taken from Statutory Instruments ('S.I') No. 600 of the Planning and Development Regulations (as amended):

> *"All minerals and substances in or under the land of a kind ordinarily worked by underground or by surface working for the removal but does not include turf."*

This Mineral Dust Risk Assessment considers both Suspended Dust and Disamenity Dust. Dust arising from the quarry can reduce amenity in the local community due to visible dust plumes and dust soiling [1]. The generally coarser dust that leads to these effects may, therefore, be referred to as 'disamenity dust'. The smaller dust particles can remain airborne for longer, potentially increasing local ambient concentrations of suspended particulate matter (e.g. PM10[1] and to a lesser extent $PM_{2.5}$), which is associated with a range of health effects [1]. This is commonly referred to as 'Suspended Dust'.

[1] PM10 refers to particulate matter with a diameter of 10 micrometers or less.

Figure 9-1: Flowchart of steps associated for the Assessment of Mineral Dust



9.2.3 Air Quality Standards

Assessment of the significance of emissions to air is made with reference to limit values established through the Clean Air for Europe (I) Directive (2008/50/EC), which was transposed into Irish law in 2011 (S.I. No. 180 of 2011).

The Air Quality Standard ('AQS') for PM_{10} set out in S.I. No. 180 of 2011 is shown in Table 9-1. The AQS are based on the effects of pollutants on human health, although other factors, such as effects on vegetation and ecosystems, are also considered.

Table 9-1: Air Quality Standards ('AQS') Limit Values

Pollutant	Objective			
	Concentration	**Maximum No. of Exceedances permitted**	**Exceedance Expressed as Percentile**	**Measured as**
Particles (PM_{10})	50µg/m^3	35 times in a year	90.40th percentile	24 hour mean
	40µg/m^3	None	-	Annual mean

The above AQS limit values are applicable to the air quality in the locality of the Proposed Development.

9.2.4 Dust Deposition Limits

The EPA's Guidelines for Extractive Industries and the DEHLG Guideline for Quarries and Ancillary Activities [4], indicates that quarries, by their nature, generate dust, with the main impact being disamenity due to dust deposition. The Proposed Development and associated activities may give rise to dust. As such, it has been determined based on the above guidelines and the MOR Environmental accessor that dust deposition limits that are generally applied to quarry operations are relevant to the Proposed Development.

However, there are currently no Irish statutory limits relating specifically to dust deposition thresholds for dust. The Bergerhoff Method for monitoring of deposited dust is specified in the German Technical Instructions on Air Quality Control (TA Luft) Air Quality Standards is typically adopted in Ireland [13] and TA Luft stipulates a dust deposition limit value of 350mg/m^2/day (when averaged over a 30-day period) is typically set as a limit along the boundary of quarries and infill developments in Ireland. Both the EPA Guidelines for Extractive Industries and the DEHLG Guideline for Quarries and Ancillary Activities utilise this method to protect amenity at sensitive receptors near quarries.

9.3 Receiving Environment

EU legislation on air quality requires that all Member States divide their territory into zones for the assessment and management of air quality. The current trends in air quality in Ireland are reported in the EPA publication Air Quality in Ireland (Key Indicators of Ambient Air Quality) – Annual Report 2023, [14] the most recent report on air quality in Ireland.

For ambient air quality management and monitoring in Ireland, four zones, A, B, C and D, are defined in the AQS Regulations (S.I. No. 180 of 2011) as follows:

- Zone A: Dublin Conurbation;
- Zone B: Cork Conurbation;
- Zone C: 24 cities and large towns. Includes Galway, Limerick, Waterford, Clonmel, Kilkenny, Sligo, Drogheda, Wexford, Athlone, Ennis, Bray, Naas, Carlow, Tralee, Dundalk, Navan, Newbridge, Mullingar, Letterkenny, Celbridge and Balbriggan, Portlaoise, Greystones and Leixlip; and,
- Zone D: Rural Ireland, i.e. the remainder of the State excluding Zones A, B & C.

The Proposed Development is located in Zone D. Table 9-2 shows the baseline air quality data in a number of Zone D regions.

9.3.1 Background Concentration of Relevant Pollutants

Background concentrations available from the representative monitoring stations operated by the EPA were used for this risk assessment. The selected background concentrations are

based on the average of the appropriate zonal concentrations. In this case, the Site is situated in Zone D (Rural Ireland).

AG4 recommends that an average of 2 to 3 years of data is used as appropriate background concentrations. Table 9-2 show air quality data for Zone D for PM_{10} for the years 2022 and 2023 as presented in the EPA Air Quality [15] reports, [16] most recent dataset available at the time of writing.

Table 9-2: PM_{10} for Zone D EPA monitoring stations (2022-2023)

Monitoring Station	PM_{10} Annual Mean (µg/m³)	
	2022	2023
Askeaton	9.4	8.4
Birr	14.5	13.1
Carrick-on-Shannon	-	8.9
Castlebar	11.2	9.9
Cavan	11.0	10.0
Claremorris	7.9	8.1
Cobh Carrignafoy	13.2	11.8
Cobh Cork Harbour	14.4	11.4
Edenderry	17.7	16.3
Enniscorthy	15.0	13.3
Kilkitt	8.5	7.1
Killarney, Co. Kerry	9.1	8.9
Longford	16.0	13.1
Macroom	16.1	11.3
Malin Head	-	12.8
Mallow	13.5	10.5
Roscommon Town	11.2	9.7
Tipperary Town	13.9	10.8
Annual Average	12.8	10.9
Average Zone D	**11.8µg/m³**	

The average background annual mean PM_{10} value for Zone D for the period 2022-2023 was 11.8µg/m³. The closest EPA station to the Development is Cavan Town (Station 78), ca.32km to the northwest of the Site. Concentrations at the station range between 10µg/m^3 and 11µg/m^3 for the years 2022 and 2023. The EPA's Guidance on Air Dispersion Modelling (AG4) requires a minimum of two consecutive years of background ambient air quality data [99]. Given the proximity of the Cavan Town monitoring station to the Site, an average of the 2022 and 2023

PM_{10} concentrations (10.5 µg/m^3) was adopted as appropriate ambient background concentrations for the risk assessment (section 9.4).

9.3.2 Sources of Emissions to Air

Notable sources of emissions to air in the vicinity of the Proposed Development include:

- Traffic associated with the regional R195 road and local roads;
- Agricultural activities;
- Residential dwellings (solid fuel fires etc.) from the nearby town of Oldcastle; and,
- An adjoining quarry (BD Flood, registered as QY24).

The QY24 quarry development with a shared boundary along the western part of the Site, which comprises an embankment of untouched ground separating the two developments, was considered from a cumulative dust effects perspective in section 9.7 below.

There is one EPA Industrial Emissions ('IE') licenced site within 5km of the Proposed Development (ca. 4.2km west). This site is Ballymanus Pig Unit and is Licenced under class 6.2 Intensive Agriculture. There are no emissions to air from dust/PM10 at this facility. The potential for cumulative and in-combination effects between the Proposed Development and the IE licenced sites is not likely, primarily due to the distance between the majority of these licensed sites and the Proposed Development.

9.3.3 Baseline Bergerhoff Dust Monitoring

For the period 31st January to 25th April 2025 (four sampling events), Bergerhoff monitoring was conducted at four locations to establish baseline conditions at the Site (see Figure 9-2 below). The location of the Bergerhoff jars were determined by experienced MOR Environmental monitoring personnel, with the contents of the jars analysed by an accredited laboratory.

Figure 9-2: Historic Dust Monitoring Locations

The results of the Bergerhoff dust monitoring are presented in Table 9-3 below.

Table 9-3: Bergerhoff Dust Monitoring Results for 2025

Monitoring Locations	Monitoring Event 1 31/01/2025- 28/02/2025	Monitoring Event 2 28/02/2025 28/03/2025	Monitoring Event 3 28/03/2025- 25/04/2025	TA Luft Limit mg/m²/day
DM1	107	49	40	350
DM2	162	45	58	350
DM3	284	37	75	350
DM4	93	86	187	350

Over the three-baseline monitoring periods, the annual mean values recorded were below the TA Luft limit value of 350mg/m^2/day. No individual elevated concentrations of dust results were recorded.

9.3.4 Dust Sensitive Receptors

The IAQM Guidelines state that adverse impacts from sand and gravel quarries are uncommon beyond 250m and at distances greater than 400m from hard rock quarries. These distances are measured from the nearest dust-generating activities. The Proposed Development involves the extraction of sands and gravels from an existing quarry; however, a conservative approach was used in this assessment and as such, receptors were identified within 400m of the Site. The following risk assessment included receptors within 400m of dust-generating activities (Figure 9-6).

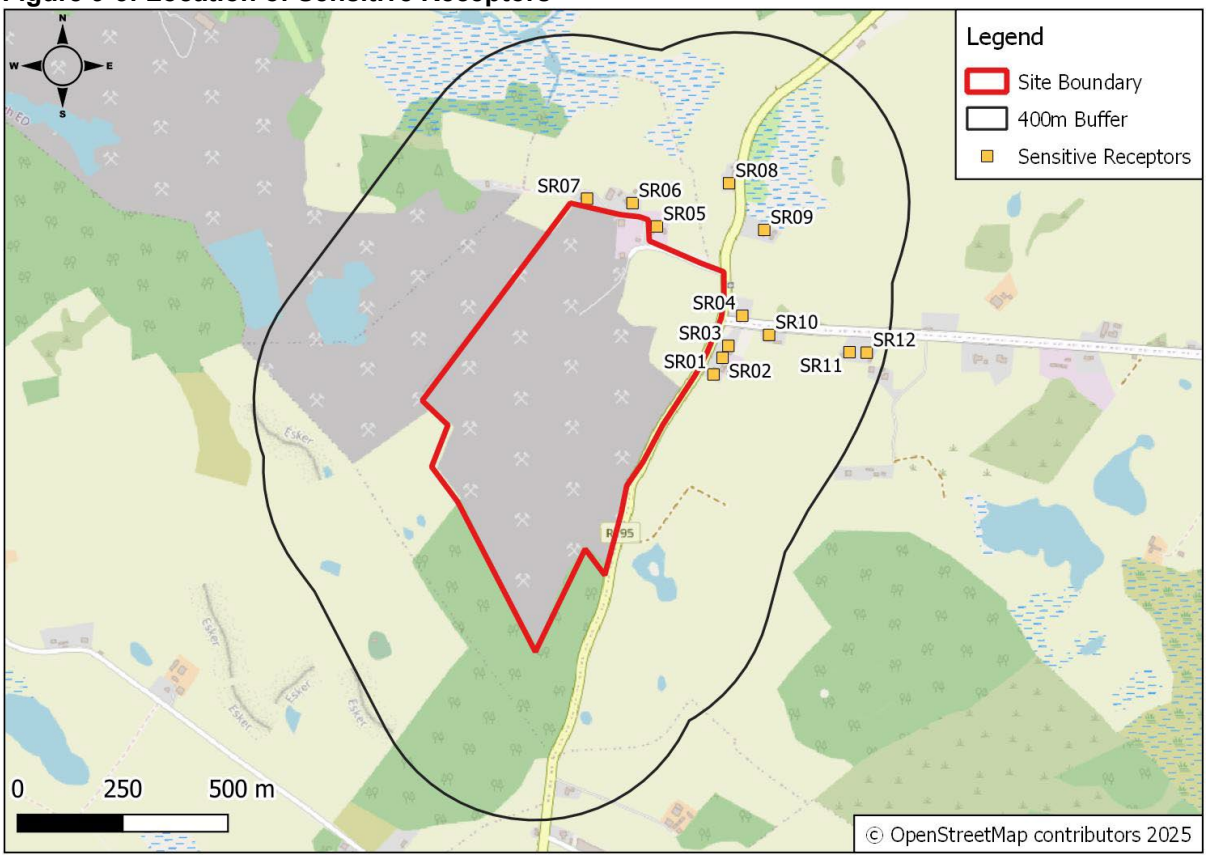
Twelve receptors were identified within 400m of dust-generating activities at the Site (SR01-SR12). The sensitive receptors are presented in Table 9-4 and shown in Figure 9-2.

Table 9-4: Identification of Receptors

ID	ITM (Easting, Northing)		Description of Sensitive Receptor	Distance/ Orientation from the Development Boundary (m)	Terrain/ Land use between Site and Receptor
	E	N			
SR01	652854	774806	Residential Dwelling	ca.42m (east)	The land use between the receptor and source of potential dust generation includes a hedgerow / scrub and road to the east of the Site.
SR02	652875	774846	Residential Dwelling	ca. 39m (east)	The land use between the receptor and source of potential dust generation includes a hedgerow / scrub and road to the east of the Site.
SR03	652889	774874	Residential Dwelling	ca. 52m (east)	The land use between the receptor and source of potential dust generation includes a hedgerow / scrub and road to the east of the Site
SR04	652922	774946	Residential Dwelling	ca. 50m (east)	The land use between the receptor and source of potential dust generation includes a hedgerow / scrub and road to the east of the Site with an additional treeline that acts as a buffer for this receptor.
SR05	652720	775158	Residential Dwelling	ca. 25m (north)	The land use between the receptor and source of potential dust generation includes a hedgerow / scrub and road to the east of the Site with an additional treeline that acts as a buffer for this receptor.
SR06	652662	775213	Residential Dwelling	ca. 37m (north)	The land use between the receptor and source of potential dust generation includes a hedgerow / scrub and small field north of the Site.
SR07	652554	775224	Residential Dwelling	ca. 41m (north)	The land use between the receptor and source of potential dust generation includes a hedgerow / scrub and small forest to the north of the Site.
SR08	652891	775260	Residential Dwelling	ca. 201m (north)	The land use between the receptor and source of potential dust generation includes a hedgerow / scrub and agriculture fields north of the Site.

ID	ITM (Easting, Northing)		Description of Sensitive Receptor	Distance/ Orientation from the Development Boundary (m)	Terrain/ Land use between Site and Receptor
	E	N			
SR09	652975	775150	Residential Dwelling	ca. 139m (east)	The land use between the receptor and source of potential dust generation includes a hedgerow / scrub, road and agriculture fields north of the Site
SR10	652986	774900	Residential Dwelling	ca. 121m (east)	The land use between the receptor and source of potential dust generation includes a hedgerow / scrub, road and agriculture fields north of the Site.
SR11	653177	774859	Residential Dwelling	ca. 316m (northeast)	The land use between the receptor and source of potential dust generation includes a hedgerow / scrub and road to the east of the Site with an additional treeline that acts as a buffer for this receptor.
SR12	653218	774858	Residential Dwelling	ca. 355m (northeast)	The land use between the receptor and source of potential dust generation includes a hedgerow / scrub and road to the east of the Site with an additional treeline that acts as a buffer for this receptor.

Figure 9-3: Location of Sensitive Receptors

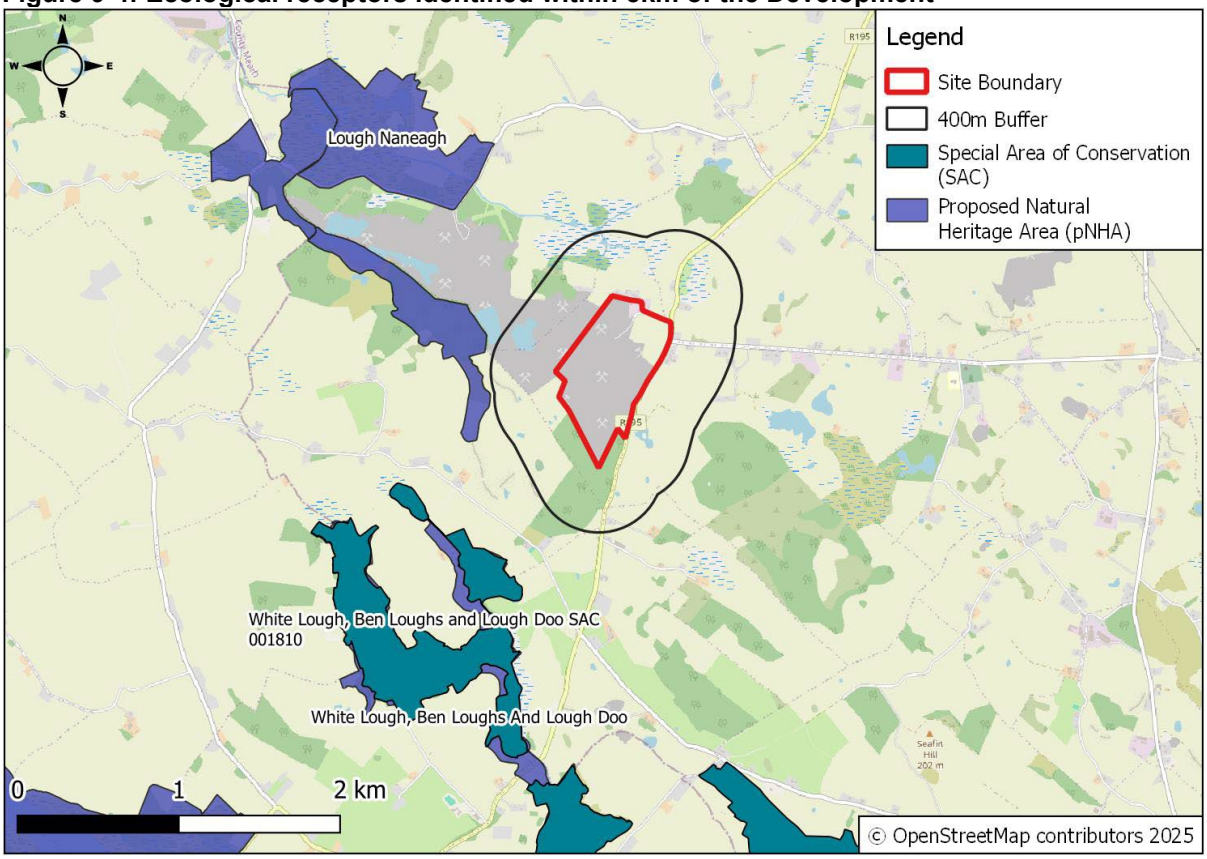


9.3.5 Designated Ecological Receptors

There are no European Designated sites located within 400m of the Proposed Development, with the closest proposed Natural Heritage Site (Lough Naneagh pNAH) located ca. 440m to the west. The White Lough, Ben Loughs and Lough Doo ('SAC') is located ca. 800m to the south of the Site. Further details on the potential effects of the Proposed Development on ecological receptors are presented in Chapter 6 and shown in Figure 9-4.

Given the distance of the Proposed Development to the nearest ecological receptors, the potential for fugitive dust emissions to impact these receptors was determined as not likely and not significant and no further assessment was undertaken.

Figure 9-4: Ecological receptors identified within 5km of the Development



9.3.6 Weather Conditions

Weather conditions can have a significant effect on the dispersion of ambient dust, thus influencing the impacts on nearby sensitive receptors. Higher levels of dust generation typically occur during dry spells associated with medium to strong breezes (>5.0m/s) [17]. A wind rose was prepared for a five-year period (2020 to 2024) to determine the potential influence of wind direction and wind speed on airborne dust particles. The nearest synoptic meteorological station, which provides hourly data, is Mullingar, Co. Westmeath. The Mullingar station is located ca. 21.5km south of the Proposed Development. The weather conditions at this meteorological station are broadly representative of the weather conditions at the Site.

A wind rose utilising five years of data indicates that the prevailing wind blows primarily from a southerly westerly direction, followed by southerly and north-westerly winds, as presented in (Refer to Figure 9-5).

Figure 9-5: Windrose Diagram from Mullingar, Co. Westmeath (2020-2024).

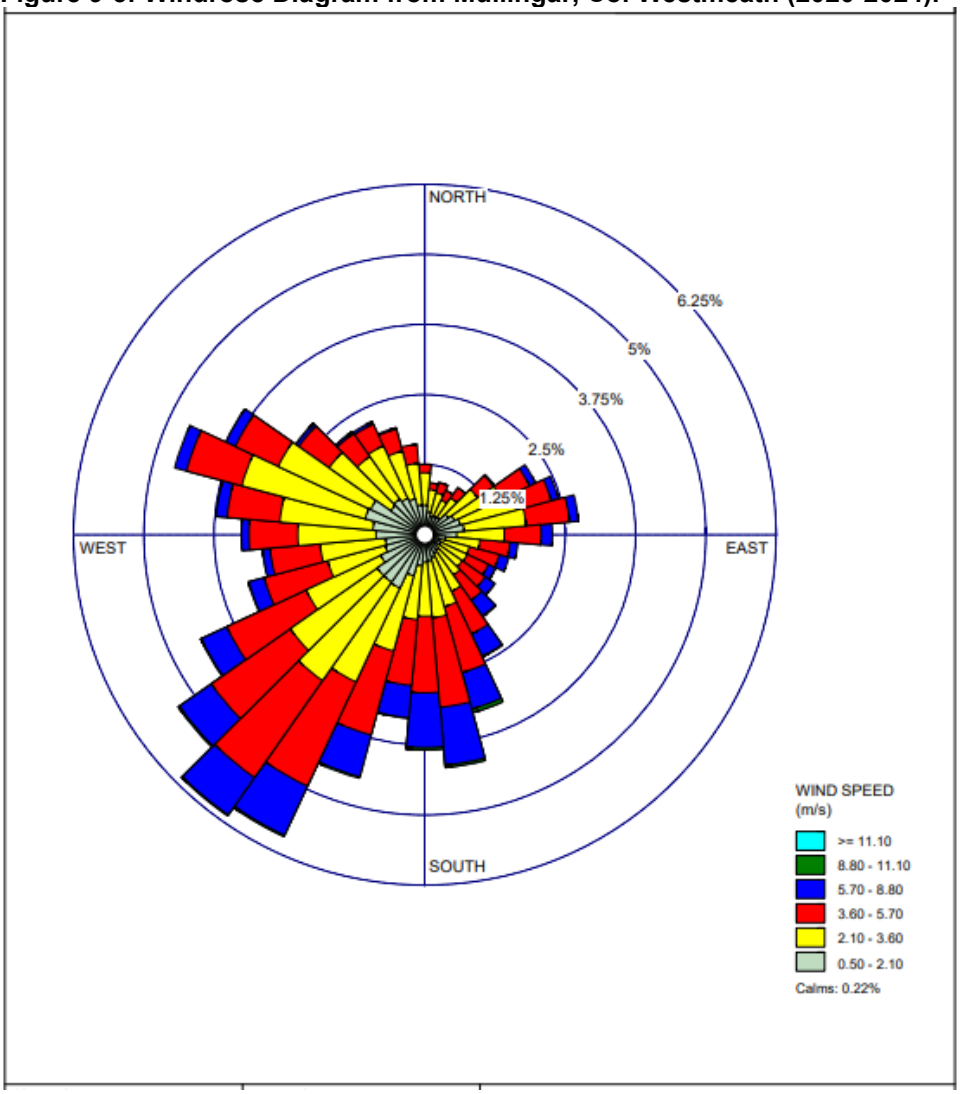


Table 9-5 summarises the important meteorological variables recorded at the Mullingar station between 2020-2024.

Table 9-5: Meteorological Data at Mullingar, Co. Westmeath (2020-2024)

Year	Total Precipitation (mm)	Average Windspeed (m/s)
2020	1078.9	3.4
2021	980.8	2.9
2022	1001.8	3.1
2023	1158.5	3.1
2024	891.5	3.1

9.4 Characteristics and Potential Effects of the Proposed Development

9.4.1 Overview of the Proposed Development

The activities associated with the Proposed Development will include crushing and screening of sands and gravels, extraction and primary processing, including potential dust-generating activities, such as:

- Site preparation / restoration (working soil and overburden);
- Operational stage (Extraction/Processing);
- Materials handling;
- Mineral Processing;
- Onsite transportation; and,
- Offsite truck movements (potential track out).

The Site has a total area of 40.12ha (including the future extraction area of ca. 6.35ha), and there is a long history of quarrying associated with the Site. The Site has evidence of pre-1963 origins. The Site has been in possession of the Applicant's family since the commencement of works and continues to be in regular use.

The entrance gate to the Site is off the R195 regional road on the east boundary. The Site has pre-existing infrastructure consisting of office and welfare facilities, storage shed, maintenance shed, fuel tanks, and vehicle parking located in the northern portion of the Site. The extraction area comprises a small portion of the Site. Stockpiles are present throughout the quarry floor, and the settlement canal system is located in the centre of the Site. The eastern boundary consists of a high bank, separating the Site from the road. To the north, the L68185 local road climbs, and the Site is partially visible. To the south, the land use is largely agricultural and forestry, and natural, undulating topography screens the Site. To the west of the Site, an adjacent quarry and associated works owned by BD Flood are separated by a ridge of land left at its original ground level with fencing and hedgerows on the ridge top.

The Proposed Development will consist of the following works:

- Reinstatement works in the south and west of the existing Site as shown in Chapter 3, Figure 3-3;
- Continued use of the current operational facilities on the Site, e.g. buildings, machinery, roadways, the settlement canal and the settlement ponds; and,
- Future extraction of sands and gravels in two designated areas as shown in Figure 9-5.

The works required for the Proposed Development will have three distinct stages:

- Stage 1 – Site preparation;
- Stage 2 – Site operation; and,
- Stage 3 – Restoration.

Unlike a greenfield development or extension, the majority of the Site is already exposed and prepared for operational works. As such soil stripping under Stage 1 Site preparation will only be relevant to the greenfield elements located on the northeastern boundary as shown in Figure 9-6 below.

Figure 9-6: Future Extraction Areas

Stage 2 site operations will be subdivided into specific phases, covering the removal of existing stockpiles, and the deepening of the quarry in two distinct areas within the Site.

Similarly, Stage 3 Restoration works will commence within areas of the Site where future reserves are not sought and will run in tandem with Stage 2 operational activities elsewhere on the Site. Please refer to Chapter 3 for further details on the individual Stages.

The Site generally comprised of an extensive quarry floor with haul routes extending to the screening plant and equipment. The following mobile equipment will be operational as part of the Proposed Development:

- Dry mobile screening plant;
- Wet semi-mobile screening plant;
- Semi-mobile crushing plant;
- Two Tracked Excavators;
- Two Wheel Loaders; and,
- Two Rock Breakers.

This plant was of high specification, highly efficient and fuel-efficient. There will be up to 20 HGVs accessing the Site daily as part of the Proposed Development.

9.4.2 Disamenity Dust Risk Assessment

The assessment of disamenity dust follows the Source-Pathway-Receptor Concept, whereby a combination of the Residual Source Emission (Source), frequency of wind speeds (Pathway) and the distance of the receptors to the source (Receptor) determines the likely impacts of disamenity dust. Residual Source Emissions were determined for all activities associated with the Proposed Development and will be discussed as cumulative sources of dust emissions.

Table 9-6 below shows the estimation of the magnitude of Residual Source Emissions.

The magnitude of the Residual Source Emissions was determined based on the scale of the anticipated operations at any one time and was classified between small and large, taking into account the designed-in mitigation, see section 9.6.1. The assessment in Table 9-6 was completed in accordance with the IAQM Mineral Dust Guidance [1], see Appendix 9-1. The site preparation and mineral extraction phases will occur simultaneously as detailed in section 9.4.1.

Table 9-6: Classification of Residual Source Emissions

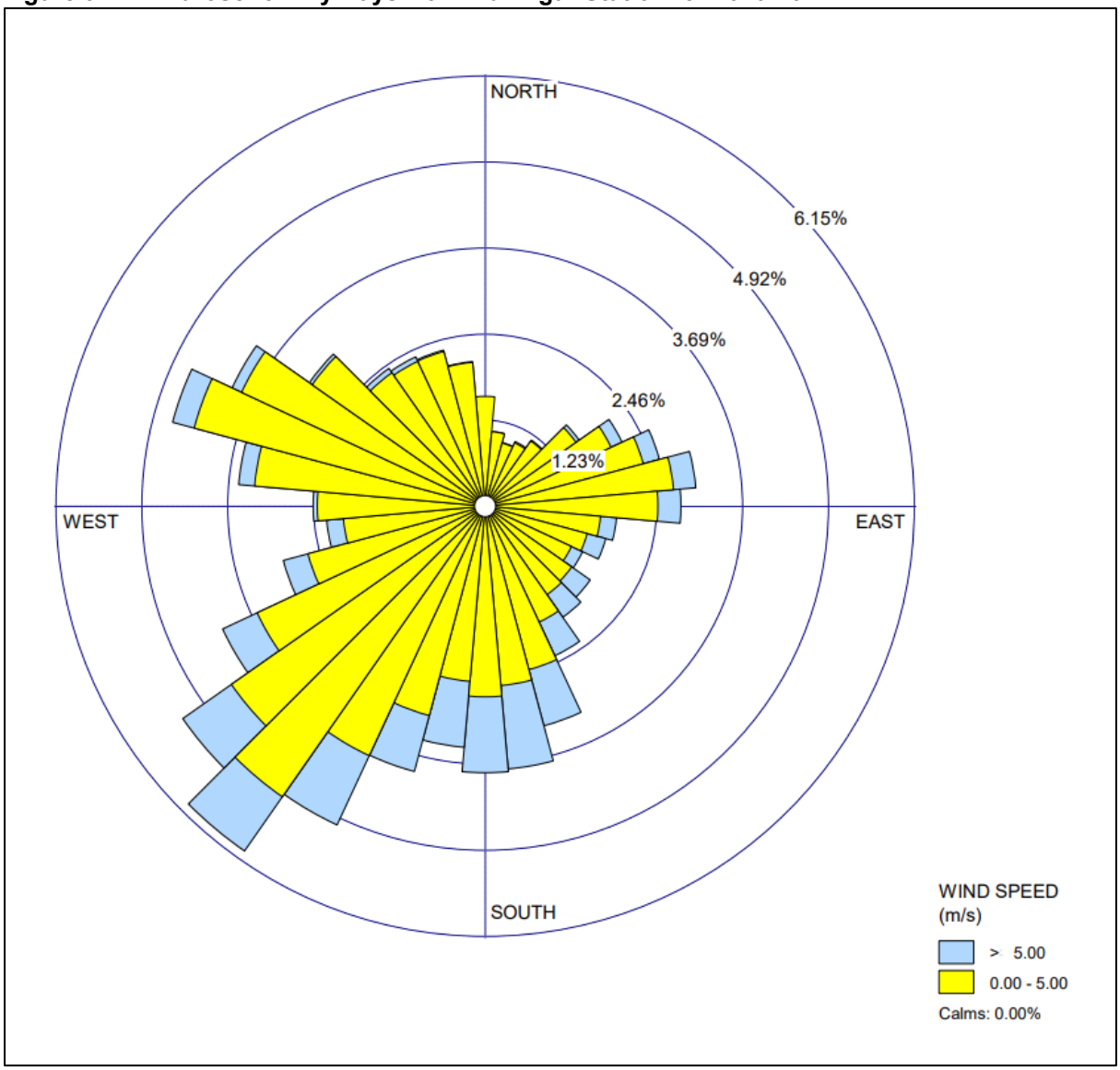
Activity	Activity Details (all values are approximate)	Magnitude of Residual Source Emissions
Site Preparation/Restoration	• Active site area for excavation ca. 6.35 ha; • There will be less than ca. 200,000 tpa aggregate extracted; • dry and wet screening plants, a crushing plant, two excavators, two wheel loaders and a rock breaker will be used daily for the processing and movement of aggregates; and, • Temporary Stockpiling will occur (less than 12 months).	**Medium**
Mineral Extraction	• dry and wet screening plants, a crushing plant, two excavators, two wheel loaders and a rock breaker will be used daily for the processing and movement of aggregates; • There will be less than ca. 200,000 tpa aggregate extracted; and, • No drilling or blasting activities will occur.	**Medium**
Material Handling	• Majority of materials handled will be in the quarry pit which is naturally screened hence providing some cover from the wind; • Some material handling activities will take place within 50m of the Site boundary; and, • Two-wheel loaders will be used daily.	**Medium**
Onsite Transportation	• There will be up to 20 HGV movements (20 trips inward and 20 trips outward) collecting aggregates per day;	**Medium**

Activity	Activity Details (all values are approximate)	Magnitude of Residual Source Emissions
	• HGVs will transport materials via gravel haul routes and will pass through a wheel wash before exiting the quarry via the Site entrance onto the R195 regional road; • HGVs traversing unpaved access routes will be minimised, where practicable; and, • HGVs will be subject to current speed limits (i.e. 15km/hr).	
Mineral Processing	• Dry and wet screening plant onsite including crushing plant; and, • Less than 200,000tpa extraction rate.	**Low**
Stockpiling/Exposed Surfaces	• Stockpiling of aggregate will occur within the quarry pit, hence providing some cover from the wind; and, • Stockpiles will be temporary and removed offsite (less than 12 months).	**Medium**
Offsite Transportation	• There will be up to 20 HGV outward trips from the Site per day; • HGVs will primarily traverse well maintained access routes; • The HGVs will go through a wheel wash before leaving the Site; and • There will be a road sweeper available to clean public roads, if necessary.	**Medium**

The residual source of emission quantifies the dust magnitude expected to be generated by activities, including built-in designed mitigation measures but also any additional mitigation measures applied. The IAQM guidance criteria for the Proposed Development was determined to have a “medium” residual source of emissions. To determine the impact on sensitive receptors, it is important to consider how the dust will be transported, i.e. the Pathway Effectiveness [1]. The site-specific factors considered to determine the Pathway Effectiveness of the dust emissions are the distance and direction of receptors, relative to the prevailing wind directions.

For each receptor, wind frequency with speed >5m/s from the direction of the dust source emission was calculated for the five years of Met Eireann data for the EPA Mullingar monitoring station (2020-2024). A wind speed of 5m/s is characterised as a moderate breeze and is used as a general threshold for determining when dust dispersion is most likely to occur [1]. The IAQM indicates high risk meteorological conditions as when the wind is coming from the direction of the dust source at a sufficient strength, during periods of little or no rainfall (<0.2mm) or ‘dry days’. As such, the meteorological information used for the risk assessment was filtered to only represent dry days. The direction and frequency of these wind speeds on dry days are shown in Figure 9-7.

Figure 9-7: Windrose for Dry Days from Mullingar Station for 2020-2024



Criteria for wind speed, ranging from infrequent to very frequent, are detailed in Appendix 9-1. Table 9-7 details the categorisation of wind related to each sensitive receptor along with the pathway effectiveness, as per the IAQM Guidelines [1].

The receptor distance from the dust source are categorised as:

- close for a receptor less than 100m;
- intermediate for a receptor between 100-200m; and,
- distant for a receptor between 200-400m.

Table 9-7 details these sensitive receptors ('SRs'), and their classification based on the Pathway Effectiveness.

As all the SRs are residential dwellings, their sensitivity to dust deposition is high.

Considering the distance of the receptors from the emission source and the frequency of winds (>5.0m/s) on dry days, the pathway effectiveness was derived for each sensitive receptor. Table 9-7 presents the pathway effectiveness for the 12 receptors.

Table 9-7: Pathway Effectiveness for Sensitive Receptors

SR ID (Receptor Sensitivity)	Distance from the Emission Source (Orientation to emission source) [17]	Frequency of wind from the direction of dust source (dry weather) (>5.5m/s)	Pathway Effectiveness
SR01	ca.42m (east) **Close**	1.21% (531hours) of wind coming from the west and southwest (245-295 degrees). **Infrequent**	**Ineffective**
SR02	ca. 39m (east) **Close**	1.21% (531hours) of wind coming from the west and southwest (245-295 degrees). **Infrequent**	**Ineffective**
SR03	ca. 52m (east) **Close**	1.43% (630 hours) of wind coming from the west and southwest (285-295 degrees) **Infrequent**	**Ineffective**
SR04	ca. 50m (east) **Close**	2.93% (1288 hours) of wind coming from the west and southwest (215-265 degrees) **Infrequent**	**Ineffective**
SR05	ca. 25m (north) **Close**	4.6% (2036 hours) of wind coming from the south and southwest (185-235 degrees) **Infrequent**	**Ineffective**
SR06	ca. 37m (north) **Close**	5.1% (2249 hours) of wind coming from the south and southwest (165-215 degrees) **Moderately Frequent**	**Moderately effective**
SR07	ca. 41m (north) **Close**	0.17% (76 hours) of wind coming from the south and southwest (315-5 degrees) **Infrequent**	**Ineffective**
SR08	ca. 201m (north) **Distant**	2.8% (1262 hours) of wind coming from the west and southwest (205-235 degrees) **Infrequent**	**Ineffective**
SR09	ca. 139m (east) **Intermediate**	2.7% (1183 hours) of wind coming from the west and southwest (215-255 degrees) **Infrequent**	**Ineffective**

SR ID (Receptor Sensitivity)	Distance from the Emission Source (Orientation to emission source) [17]	Frequency of wind from the direction of dust source (dry weather) (>5.5m/s)	Pathway Effectiveness
SR10	ca. 121m (east) **Intermediate**	1.2% (529 hours) of wind coming from the west and southwest (235-275 degrees) **Infrequent**	**Ineffective**
SR11	ca. 316m (northeast) **Distant**	0.52% (231 hours) of wind coming from the west and southwest (255-285 degrees) **Infrequent**	**Ineffective**
SR12	ca. 355m (northeast) **Distant**	0.52% (231 hours) of wind coming from the west and southwest (255-285 degrees) **Infrequent**	**Ineffective**

Note: Close receptors include 5 increments of degrees when determining % wind frequency. Intermediate receptors include 4 increments of degrees. Distant receptors include 3 increments of degrees.

Table 9-7 shows that all sensitive receptors except SR6 had an “ineffective” pathway.

To identify the potential risk of dust impacts on the receptors, the pathway receptors, the pathway effectiveness and residual source emissions were considered [17]. The estimation of dust impact risk from this process is outlined in Table 9-8.

Table 9-8: Dust Impact Risk for Sensitive Receptors

SR ID	Residual Source Emission	Pathway Effectiveness	Dust Impact Risk
SR01	Medium	Ineffective	Negligible
SR02	Medium	Ineffective	Negligible
SR03	Medium	Ineffective	Negligible
SR04	Medium	Ineffective	Negligible
SR05	Medium	Ineffective	Negligible
SR06	Medium	Moderately Effective	Low Risk
SR07	Medium	Ineffective	Negligible
SR08	Medium	Ineffective	Negligible
SR10	Medium	Ineffective	Negligible
SR11	Medium	Ineffective	Negligible
SR12	Medium	Ineffective	Negligible

The potential risk of dust impact on the sensitive receptors as a result of the Proposed Development has been determined as “negligible” for all sensitive receptors except SR6 which has been determined as “low risk”.

To determine the magnitude of dust impact on each receptor, the risk of dust impact and the receptor sensitivity were considered. The descriptor for the magnitude of dust effect is detailed in Table 9-9.

Table 9-9: Magnitude of Disamenity Effects on Sensitive Receptors

ID	Receptor Sensitivity	Dust Impact Risk	The Magnitude of Dust Effect
SR01	High	Negligible	Negligible Effect
SR02	High	Negligible	Negligible Effect
SR03	High	Negligible	Negligible Effect
SR04	High	Negligible	Negligible Effect
SR05	High	Negligible	Negligible Effect
SR06	High	Low Risk	Slight Adverse Effect
SR07	High	Negligible	Negligible Effect
SR08	High	Negligible	Negligible Effect
SR10	High	Negligible	Negligible Effect
SR11	High	Negligible	Negligible Effect
SR12	High	Negligible	Negligible Effect

The estimated magnitude of the dust effect was determined to be “Negligible” on all sensitive receptors except SR 6, where it was determined as “Slight Adverse Effect”, as a result of the activities associated with the Proposed Development.

9.4.3 Suspended Dust Risk Assessment

The IAQM Guidance on Mineral Dust states [1]:

> *“if the long-term background PM_{10} concentration is less than 17µg/m^3, there is little risk that the Process Contribution (PC) would lead to an exceedance of the annual mean objective……. 17µg/m^3 is considered to be a suitable screening value for an assessment of annual mean PM_{10} concentrations”*

This figure is based on an estimated maximum annual process contribution of 15µg/m^3 for mineral extraction activities.

The IAQM Guidance indicates that the greatest potential for high rates of dust deposition and elevated PM_{10} concentrations occurs within 100m of dust-generating activities. [1] The EPA‘s AG4 Guidelines on determining background concentrations requires up to 2-3 years of data. [18]

When determining the background concentration of PM_{10} at the Site of the Proposed Development, a 2-year average (2022-2023) of annual PM_{10} concentrations from the closest Zone D monitoring station, i.e. Cavan Town – 10.5µg/m^3 (section 9.3.1).

Table 9-10 below shows the Predicted Environmental Concentrations (‘PEC’) of ambient PM_{10}, which combines the expected process contribution and the background concentration in µg/m^3.

Table 9-10 : Calculated PEC from Proposed Development

Parameter	PM_{10} concentrations (µg/m^3)
Maximum Process Contribution*	15µg/m^3
Background Concentration**	10.5µg/m^3
Predicted Environmental Concentration (PEC)	25.5µg/m^3
Annual AQS Limit for PM_{10}	**40µg/m^3**

***Determined from the IAQM guidance, ** derived from the nearest EPA station (2-years)**

The PEC of 25.5µg/m³ is below the Annual AQS of 40 µg/m^3. According to the IAQM Guidance [1], if the predicted environmental concentration of annual PM_{10} is less than 32µg/m^3 [8], the annual AQS limit is not expected to be exceeded and no further consideration of the risk posed by ambient PM_{10} concentrations is warranted. The effects on ambient PM_{10} concentrations from the Proposed Development were determined to be not significant.

9.5 Mitigation Measures

9.5.1 Dust Mitigation Measures

The estimated magnitude of the potential dust effect as a result of the Proposed Development was determined to be “Negligible” at all sensitive receptors except SR6 where it was determined as “Slight Adverse Effect” (section 9.4.2). It is important to note that to date, no records of dust complaints have been received by the Applicant or MCC as a result of activities associated with the existing quarry activities at the Site.

In order to reduce the potential disamenity dust effects a number of mitigation measures are recommended. Table 9-11 below details the mitigation measures required to reduce any potential dust emissions arising from the Proposed Development so that the effects are “not significant”.

A Dust Management Plan (‘DMP’) will be prepared for the Site and provided to the Local Authority in advance of works commencing. This will provide for the mitigation and management strategies within a dedicated plan.

Mitigation measures for the Proposed Development are divided into general measures (e.g. site management and maintenance) and those more specific to the Construction / Operational / Restoration Phase of the Site (e.g. HGV movements).

Table 9-11: Mitigation measures implemented at the Development

General Mitigation Measures for the Entire Site
Design Measures The design measures to reduce dust will include: • Hedgerows surrounding the Site boundary will be maintained and enhanced as required; • Extraction of the Site will be limited to the ca. 6.35ha in the northern portion of the Site, which will limit the areas of exposed soil reducing the risk of disamenity dust leaving the Site boundary; • HGVs entering/exiting the Site will occur via the existing wheel wash; and, • Exposed surfaces, e.g. topsoil and overburden storage mounds, will be planted with fast-growing plants.
Construction and Operational Stage The following mitigation measures will be implemented to minimise dust generation, during the Construction and Operational Stages: **General** • All dust and air quality complaints will be recorded, cause(s) identified, appropriate action taken; • Complaints log will be maintained at the Site office, available for review at any reasonable time; • Training will be given to Site personnel on dust mitigation measures to be implemented at the Site; • Regular inspections of Site works will be conducted. The frequency of these inspections will be increased to coincide where the risk of impact is higher during dry and/or windy conditions; and, • Good communications with the local community will be maintained.
Site preparation • Soil stripping and overburden handling will be avoided during dry and windy (>5.0m/s) conditions; and • Overburden will only be worked when it contains a high moisture content.
Mineral processing • Screening will take place within sheltered parts of the quarry to reduce the likelihood of transport of dust via wind; • Material will be dampened during dry periods prior to crushing operations; • Crushing and screening plant will be used within its design capacity; and, • All plant and equipment will be subjected to routine preventative maintenance.
Material Handling • Materials will be dampened sufficiently during dry conditions; • Clearance of any spillage during extraction will be undertaken regularly to minimise accumulation of loose dry materials; and, • Minimisation of drop heights will be ensured.
Vehicle movements • Abrupt changes in vehicle direction will be avoided where possible; • Loaded HGVs will be covered during windy conditions (>5.0m/s) as practicable; • Regular clearing, grading and maintenance of haul routes will be conducted; • All vehicles will adhere to speed restrictions within and around the quarry (15 km/hr); • Vehicles will be evenly loaded to reduce the possibility of spillages;

General Mitigation Measures for the Entire Site
• Haul routes will be dampened where required using a water bowser; • HGVs will pass through a wheel wash prior to leaving the Site; and, • Road sweepers will be utilised to maintain local roads on a need-to basis.

9.6 Cumulative and In-combination Measures

The surrounding landscape to the Site is primarily used for grazing, rather than tillage. Due to the nature of surrounding activities, minimal dust is expected to be generated directly from grazing activities. There is potential that land in the vicinity of the Site is used to cut hay and silage. However, these activities typically occur during the summer months, i.e. seasonal and occur over a short period. As such, given the seasonal nature of these potential emissions, the potential for cumulative and in combination effects is not expected to occur.

There was potential for a cumulative and in combination effect from disamenity dust from the Proposed Development and the activities within the adjacent BD Flood Quarry as this quarry is located on the lands directly adjacent to the western boundary of the Site. Due to the limited information available publicly on this BD Flood Quarry, for the purpose of this cumulative assessment, it was assumed that future quarrying activities will occur at the BD Flood Quarry (registered as QY24) within 100m of the Proposed Development. Therefore, a cumulative mineral dust risk assessment has been carried out to assess any cumulative dust risks.

Dust SRs have remained the same as stated in section 9.3.3 to assess the potential cumulative effects of the Proposed Development and the BD Flood Quarry on these SRs.

The IAQM assessment of disamenity dust follows the Source-Pathway-Receptor concept, whereby a combination of the residual source emission (Source), frequency of wind speeds (Pathway) and the distance of the receptors to the source (Receptor) determines the likely impacts of disamenity dust.

Table 9-12 details these sensitive receptors and their classification based on the Pathway Effectiveness.

Table 9-12: Pathway Effectiveness for Sensitive Receptors

SR ID **(Receptor Sensitivity)**	**Distance from the Emission Source (Orientation to emission source)** [17]	**Frequency of wind from the direction of dust source (dry weather) (>5.5m/s)**	**Pathway Effectiveness**
SR01	ca.42m (east) **Close**	1.21% (531hours) of wind coming from the west and southwest (245-295 degrees). **Infrequent**	**Ineffective**
SR02	ca. 39m (east) **Close**	1.21% (531hours) of wind coming from the west and southwest (245-295 degrees). **Infrequent**	**Ineffective**
SR03	ca. 52m (east) **Close**	1.43% (630 hours) of wind coming from the west and southwest (285-295 degrees) **Infrequent**	**Ineffective**

SR ID (Receptor Sensitivity)	**Distance from the Emission Source (Orientation to emission source)** [17]	**Frequency of wind from the direction of dust source (dry weather) (>5.5m/s)**	**Pathway Effectiveness**
SR04	ca. 50m (east) **Close**	2.93% (1288 hours) of wind coming from the west and southwest (215-265 degrees) **Infrequent**	**Ineffective**
SR05	ca. 25m (north) **Close**	4.6% (2036 hours) of wind coming from the south and southwest (185-235 degrees) **Infrequent**	**Ineffective**
SR06	ca. 37m (north) **Close**	5.1% (2249 hours) of wind coming from the south and southwest (165-215 degrees) **Moderately Frequent**	**Moderately effective**
SR07	ca. 41m (north) **Close**	0.17% (76 hours) of wind coming from the south and southwest (315-5 degrees) **Infrequent**	**Ineffective**
SR08	ca. 201m (north) **Distant**	2.8% (1262 hours) of wind coming from the west and southwest (205-235 degrees) **Infrequent**	**Ineffective**
SR09	ca. 139m (east) **Intermediate**	2.7% (1183 hours) of wind coming from the west and southwest (215-255 degrees) **Infrequent**	**Ineffective**
SR10	ca. 121m (east) **Intermediate**	1.2% (529 hours) of wind coming from the west and southwest (235-275 degrees) **Infrequent**	**Ineffective**
SR11	ca. 316m (northeast) **Distant**	0.52% (231 hours) of wind coming from the west and southwest (255-285 degrees) **Infrequent**	**Ineffective**
SR12	ca. 355m (northeast) **Distant**	0.52% (231 hours) of wind coming from the west and southwest (255-285 degrees) **Infrequent**	**Ineffective**

Note: Close receptors include 5 increments of degrees. Intermediate receptors include 4 increments of degrees. Distant receptors include 3 increments of degrees.

Considering the receptors' distance from the emission source and the frequency of winds (>5.0m/s) on dry days, the pathway effectiveness was derived for each sensitive receptor.

To identify the potential risk of dust impacts on the receptors, the pathway receptors, the pathway effectiveness and residual source emissions were considered together [17]. The estimation of dust impact risk from this process is outlined in Table 9-13.

Table 9-13: Dust Impact Risk for Sensitive Receptors

SR ID	Residual Source Emission	Pathway Effectiveness	Dust Impact Risk
SR01	Large	Ineffective	Low Risk
SR02	Large	Ineffective	Low Risk
SR03	Large	Ineffective	Low Risk
SR04	Large	Ineffective	Low Risk
SR05	Large	Ineffective	Low Risk
SR06	Large	Moderately effective	Medium Risk
SR07	Large	Ineffective	Low Risk
SR08	Large	Ineffective	Low Risk
SR10	Large	Ineffective	Low Risk
SR11	Large	Ineffective	Low Risk
SR12	Large	Ineffective	Low Risk

The risk of potential dust impact has been assessed to have been “Low Risk” for all sensitive receptors, except SR6, which has been categorised as “Medium Risk” in accordance with the IAQM Guidance as a result of the historical use of the Development. This is due to the % frequency of winds above 5m/s on Dry days being above 5% (5.1% at SR6).

To identify the magnitude of dust impact on the receptors, the risk of dust impact and the receptor sensitivity were considered together. As mentioned above, all residential properties were determined to have a high sensitivity, whilst farm/storage facilities were determined to have a low sensitivity to dust deposition.

The descriptor for the magnitude of dust impact is detailed in Table 9-14.

Table 9-14: Magnitude of Disamenity Effects on Sensitive Receptors

ID	Receptor Sensitivity	Dust Impact Risk	The Magnitude of Dust Effect
SR01	High	Low Risk	Slight Adverse Effect
SR02	High	Low Risk	Slight Adverse Effect
SR03	High	Low Risk	Slight Adverse Effect
SR04	High	Low Risk	Slight Adverse Effect

ID	Receptor Sensitivity	Dust Impact Risk	The Magnitude of Dust Effect
SR05	High	Low Risk	Slight Adverse Effect
SR06	High	Medium Risk	Moderately Adverse Effect
SR07	High	Low Risk	Slight Adverse Effect
SR08	High	Low Risk	Slight Adverse Effect
SR10	High	Low Risk	Slight Adverse Effect
SR11	High	Low Risk	Slight Adverse Effect
SR12	High	Low Risk	Slight Adverse Effect

The estimated magnitude of the potential dust effect was determined to be "Slight Adverse Effect" on all sensitive receptors, except SR6 where it has been determined to be "Moderately Adverse Effect" as a result of the cumulative activities associated with the Proposed Development and the BD Flood quarry on adjacent lands without any mitigation measures. Mitigation measures have been detailed in Section 9.6, including the implementation of a Dust Management Plan, which will reduce the potential dust effects associated with the Proposed Development. It is important to note that no historical dust complaints have been received by the Applicant, and Dust Management measures are pre-existing at the Site.

Overall, the cumulative effects from the Proposed Development and the adjacent BD Flood Quarry are considered to have a slight adverse effect on the surrounding area. This effect is considered to be 'not significant'. This is based on a consideration of the different magnitudes of effects at individual receptors, the number of receptors that would experience these different effects and the mitigation measures detailed in Section 9.6. The designed-in mitigation measures, together with the Dust Management Plan and the Bergerhoff monitoring, are considered to be appropriate to mitigate the potential effects.

As such, the cumulative and combined effect from the BD Flood Quarry activity within the vicinity of the Site was not significant. The accuracy of the findings presented is strengthened, given that the Applicant has not received a complaint regarding dust.

The background concentrations of PM_{10} (or ambient dust) have been considered in Section 9.4.1.3 above. As Zone D (which is reflective of baseline conditions) has been taken as the background concentration, there is little risk of the annual AQS limit being exceeded and no further consideration of the risk posed by ambient PM_{10} was warranted in terms of cumulative effects.

9.7 Interactions with other Environmental Attributes

- Chapter 5: Population and Human Health: Air quality is an important consideration for human health, as potential PM_{10} concentrations have the potential to effect human health. However, the assessment on air quality showed there was little risk that the Proposed Development would have exceeded the AQS standards.
- Chapter 6 - Biodiversity: Air quality can potentially effect ecosystems; however, this assessment demonstrated that the emissions to air from the Proposed Development will have no negative effects on ecosystems.
- Chapter 13 - Material Assets: Traffic & Transport: Air quality can be impacted by increased traffic volumes. However, changes to traffic volumes as a result of the

Proposed Development are low, and therefore will not effect local or regional air quality.

9.8 Indirect Effects

There have been no significant or likely indirect effects identified outside of those previously assessed throughout this chapter.

9.9 Residual Effects

Given the baseline environment, type and intensity of activities, and mitigation measures to be implemented, the potential residual effect from ambient dust (or PM_{10}) is considered to be "not significant".

For disamenity dust, the risk assessment concluded that the potential dust risk was a "Negligible" effect at all SRs except SR6 where a "Slight Adverse Effect" was determined without appropriate mitigation measures in place. When the appropriate mitigation measures detailed in section 9.6 are employed, the residual effects will be reduced to "not significant".

9.10 Monitoring

Section 9.3.6 above details the locations of existing Bergerhoff monitoring locations associated with the existing Quarry. It is proposed that four locations (D1-D4) will be monitored around the Proposed Development.

9.11 Reinstatement

The Site will be subject to a Restoration Plan following the cessation of extraction on-site. Details of the Restoration Plan are included in Appendix 6-1. These works have been fully assessed in this chapter.

9.12 Difficulties Encountered

No difficulties were encountered.

9.13 References

[1] IAQM, “Guidance on the Assessment of Mineral Dust Impacts for Planning,” Institute of Air Quality Management, London, 2016.

[2] TA Luft, “Technical Instructions on Air Quality Control,” Federal Minisitry for Environment, Nature Conservation and Nucleur Safety, Berlin, Germany, 2002.

[3] EPA, “Environmental Management in the Extractive Industry (Non-Scheduled Minerals),” Environmental Protection Agency , Wexford, 2006.

[4] DoEHLG, “Quarries and Ancillary Activities,” Department of Environment, Heritage and Local Government, Dublin, 2004.

[5] IAQM, “Guidance on the Assessment of Dust from Demolition and Constriction,” 2016.

[6] ICF, “Environmental Code,” 2005. [Online]. Available: http://www.irishconcrete.ie/wp-content/uploads/2017/01/Environmental-Code.pdf.

[7] EPA, “Air Quality in Ireland Report 2022,” EPA, Wexford, 2023.

[8] EPA, “Air Quality in Ireland 2023,” EPA, 2024.

[9] EPA, “Air Dispersion Modelling from Industrial Installations Guidance Note (AG4).,” Johnstown Castle Estate., Wexford, Ireland, 2019a.

[10] Department of Communications, Climate Action and Environmental (DCCAE), “Clean Air Strategy for Ireland,” DCCAE, 2023.

[11] DCCAE, “Draft Clean Air Strategy Public Consultation,” Department of Communications, Climate Actions and Environment, Dublin, 2022.

[12] Meath County Council (MCC), “Meath County Development Plan 2021-2027,” Meath County Council (MCC), 2021-2027.

[13] ICF, “Environmental Code - Second Edition,” Irish Concrete Federation, Dublin, 2005.

[14] EPA, “Air Quality in Ireland (Key Indicators of Ambient Air Quality) - Annual Report 2021,” Environmental Protection Agency, Wexford, 2022.

[15] EPA, “Air Quality in Ireland (Key Indicators of Ambient Air Quality) – Annual Report 2023,” EPA, Wexford, 2024.

[16] EPA, “Air Quality in Ireland (Key Indicators of Ambient Air Quality) – Annual Report 2022,” EPA, Wexford, 2023.

[17] IAQM, “Guidance on the Assessment of Mineral Dust Impacts for Planning,” Institute of Air Quality Management, London, 2016.

[18] Paul Nolan, EPA, "Research 472: Updated High-resolution Climate Projections for Ireland," EPA, 2024.

[19] EPA, "Advice Notes on Current Practice (in the preparation of Environmental Impact Statements)," EPA, 2003.

[20] IEMA, "Environmental Impact Assessment Guide to: Assessing Greenhouse Gas Emissions and Evaluating their Significance," Institute of Environmental Management and Assessment, London, 2017.

[21] EPA, "Air Quality in Ireland 2017," Environmental Protection Agency, Wexford, 2018.

[22] EPA, "Air Quality in Ireland 2018," EPA, Wexford, 2019.

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[29] EPA, "Air Quality in Ireland 2016," EPA, Wexford, 2017.

[30] Institute of Environmental Management & Assessment, IEMA, "A New Perspective on Land and Soil in Environmental Impact Assessment," IEMA, 2022.

[31] EPA, "Air Quality in Ireland (Key Indicators of Ambient Air Quality) – Annual Report 2013," Environmental Protection Agency, 2014.

[32] EPA, "Air Quality in Ireland (Key Indicators of Ambient Air Quality) – Annual Report 2014," Environmental Protection Agency, 2015.

[33] EPA, "Air Quality in Ireland (Key Indicators of Ambient Air Quality) – Annual Report 2015," Environmental Protection Agency, 2016.

[34] EPA, "Air Quality in Ireland (Key Indicators of Ambient Air Quality) – Annual Report 2016," EPA, Wexford, 2017.

[35] EPA, "Air Quality in Ireland Report 2017," Environmental Protection Agency, Wexford, 2018.

[36] EPA, "Air Quality in Ireland (Key Indicators of Ambient Air Quality) – Annual Report 2018," EPA, Wexford, 2019.

[37] EPA, “Air Quality in Ireland Report,” EPA, 2022.

[38] EPA, “Air Dispersion Modelling from Industrial Installations Guidance Note (AG4),” Environmental Protection Agency, Johnstown Castle, Co. Wexford, 2020.

Contents

10 CLIMATE

10.1 Introduction

This chapter of the EIAR provides a description and assessment of the likely effects of the Proposed Development on climate change in the context of national greenhouse gas ('GHG') emissions and relevant sectoral targets. This chapter also assesses the potential effects to the Proposed Development from identified climate hazards.

10.2 Methodology

The following plans, standards and guidance documents were used to assess the baseline conditions and in the assessment of potential impacts on climate associated with the Proposed Development:

- Meath County Development Plan 2021-2027, as varied, 2025 [1];
- Meath Climate Action Strategy 2019-2025 [2];
- Meath Climate Action Plan 2024 – 2029 [3];
- Meath County Council Climate Change Risk Assessment, 2018 [4];
- Institute of Environmental Management and Assessment ('IEMA'), *Environmental Impact Assessment Guide to Assessing Greenhouse Gases and Evaluating their Significance* (2nd Edition), 2022 [5];
- International Panel on Climate Change ('IPCC'), *Guidelines for National Greenhouse Gas Inventories*, 2019 [6];
- IPPC, *Sixth Assessment Report (AR6)*, 2023 [7];
- ISO 14064, *Part 1 Specification with guidance at the organizational level for quantification and reporting of greenhouse gas emissions and removals*, 2018 [8];
- Environmental Protection Agency ('EPA'), *Ireland's Climate Change Assessment ('ICCA')*, 2024 [9];
- Department of the Environment, Climate and Communications, *Climate Action Plan 2025*, 2025 [10];
- Department of the Environment, Climate and Communications, *National Adaption Framework, Planning for a Climate Resilient Ireland*, 2024 [11];
- Department of Environment, Climate and Communications, *Guidelines for Local Authority Climate Action Plans, Technical Annex B – Climate Change Risk Assessment,* 2023 [12];
- Transport Infrastructure of Ireland ('TII'), *Carbon Tool*, 2025 [13];
- Sustainable Energy Authority of Ireland ('SEAI'), *Energy Conversion and Emission Factors*, 2023 [14];
- Department for Energy Security and Net Zero ('DESNZ'), *Greenhouse gas reporting: conversion factors 2024,* 2024 [15]; and,
- EPA, *Climate Ireland Platform*, 2025 [16].

10.2.1 Assessment Boundary

The potential effects of the Proposed Development on climate change were determined through an assessment of the sources of GHG emissions from the Proposed Development.

The assessment of GHG emissions follows IEMA's 2022 Guidance on *"Assessing Greenhouse Gas Emissions and Evaluating their Significance"* [5], as far as possible and practical.

IEMA guidelines specify the use of emission factors, which were sourced from the TII Carbon Tool [13], the UK Department for Energy Security and Net Zero ('DESNZ') [15] and the Sustainable Energy Authority of Ireland ('SEAI') [14]. The Carbon Tool is primarily used for lifecycle assessments of national roads, greenways and light rail projects; however, it provides a comprehensive list of emission factors and methods to calculate GHG emissions that are relative to the Proposed Development.

The potential risks of climate change to the Proposed Development have been assessed by completing a climate vulnerability assessment. By utilising available policy and guidance documentation, the vulnerability of assets associated with the Proposed Development to potential climate hazards was determined. The identification of climate hazards was achieved through a detailed desk-based review of local, regional and continental scale tools.

Due to the size and nature of the Proposed Development, there are no potential effects on microclimate in terms of wind tunnelling and shading. As such, the potential effects on microclimate will not be assessed any further in this EIAR[1].

10.2.2 Policy Context

The following section will review and highlight relevant policies and legislation relating to the Proposed Development in the context of national, regional and local climate objectives.

10.2.2.1 Paris Climate Agreement

The Paris Agreement is a legally binding international treaty on climate change that was adopted by 196 parties at the COP 21 in Paris 2015 [17]. The goal of the agreement is to limit global warming to below 2°C, preferably 1.5°C, compared to pre-industrial levels. The agreement aims to reach global peaking of GHG emissions as soon as possible to achieve climate neutrality by 2050. The agreement includes commitments from all countries to reduce their emissions and work together to adapt to the impacts of climate change and calls on countries to strengthen their commitments over time. The agreement provides a pathway for developed nations to assist developing nations in their climate mitigation and adaptation efforts while creating a framework for the transparent monitoring and reporting of countries' climate goals.

10.2.2.2 National Adaptation Climate Framework

The National Adaptation Framework ('NAF') was developed in 2018 under the Climate Action Law and Low Carbon Development Act 2015. The second statutory NAF, published in 2024 [11] supersedes the first NAF, which was developed in 2018. The key objective of the NAF is to support climate action by setting out policies to become resource-efficient and contribute to a low-carbon economy.

The NAF aims to set out a national strategy to reduce the vulnerability of the country to climate change and to improve the enabling environment for adaptation through ongoing engagement with civil society, the private sector and the research community [11].

[1] *Microclimate can be described as the climate within 1-2km of a site. The microclimate of an area is influenced by both the natural (topographic) and the built environment (buildings and structures). The construction of new structures impacts existing microclimates and creates new ones of great complexity depending on the design, density and function of the building. Microclimate impacts are typically associated with dense urban development involving tall structures and refer to shading and wind tunnelling.*

As the extractive industry is not currently identified under the NAF, this assessment has utilised the plan to provide context only. For the purpose of the assessment of GHG emissions, GHG emissions as a result of the Proposed Development were compared to the National Carbon Budget 2026-2030 and Sectoral Emission Ceilings for Transport and Electricity.

10.2.2.3 National Carbon Budget and Sectoral Emissions Ceilings

The National Sectoral Emission Ceilings refer to the total amount of permitted GHG emissions that each sector of the economy may produce during a specific period.

Under Section 6C of the Climate Action and Low Carbon Development Act 2021 (as amended) [18], sectoral emission ceilings outline the maximum GHG emissions that are permitted in different sectors of the Irish economy. The Act commits Ireland to achieving climate neutrality by 2050. The carbon budget programme, which includes three successive 5-year periods of national emission ceilings, is measured in tonnes of CO_2e ('tCO_2e')[2].

The 2021 Act established the Climate Change Advisory Council ('CCAC') to provide independent advice to the Irish Government on climate action. The initial provisional Third Carbon Budget of 151 $MtCO_2e$ was proposed in 2021 alongside the establishment of the First and Second Carbon Budgets.

In December 2024, the CCAC published its *"Carbon Budget Proposal Report"* [19], in which the CCAC proposed to finalise the Third Carbon Budget, following the expiration of the First Carbon Budget (2021-2025). The finalised Third Carbon Budget (2031-2035) of 160 $MtCO_2e$ and a provisional Fourth Carbon Budget (2036-2040) of 120 $MtCO_2e$ were included in the proposal. The proposed increase of the Third Carbon Budget from 151 $MtCO_2e$ to 160 $MtCO_2e$ reflects the most recent data, which focuses on temperature-neutrality pathways as opposed to constraining data analysis of Ireland to meeting net zero emissions in the average global warming potential over 100 ('GWP_{100}') [19]. This resulted in an increase of 9 $MtCO_2e$ from the 2021 provisional Third Carbon Budget.

The proposal was submitted to the Minister for the Environment, Climate and Communications in December 2024, where it will undergo further review and approval and is subject to revision. For the purposes of this assessment, the potential GHG emissions associated with the Proposed Development will be presented in the context of the National Second Carbon Budget as outlined below in Table 10-1.

Table 10-1: Ireland's National Carbon Budget

National Carbon Budget	Emission Ceiling for Assessment Period (tCO2e)
First Carbon Budget (2021-2025)	295,000,000
Second Carbon Budget (2026-2030)	200,000,000
Proposed Third Carbon Budget (2031-2035)*	160,000,000
Provisional Fourth Carbon Budget (2036-2040)*	120,000,000

**The CCAC's proposals for both the Third and Fourth Carbon Budgets were calculated based on GWP100 as published in the IPCC Fifth Assessment Report.*

Within the national carbon budgets, sectoral emission ceilings have been established to reflect the EPA's Emission Inventory. Currently, the sectoral emission ceilings are only presented for the first two carbon budget periods (2021-2025 and 2026-2030). The sectoral emission

[2] *Carbon Dioxide Equivalent ('CO_2e') is a metric measure used to compare the emissions from various greenhouse gases on the basis of their global-warming potential ('GWP'), by converting amounts of other gases to the equivalent amount of carbon dioxide with the same global warming potential.*

ceilings for the Third Carbon Budget will be prepared and finalised by the Government following the review of the CCAC proposal as discussed above, as per Section 6C of the Act.

GHG emissions associated with the Proposed Development will also be compared with the Sectoral Emission Ceilings for Transport and Electricity in Table 10-2 below, as approved by the Government in 2022 [20].

Table 10-2: Sectoral Emission Ceilings Relative to the Proposed Development

Sectors	Second Sectoral Emission Ceiling 2026-2030 (tCO_2e)
Transport	37,000,000
Electricity	20,000,000

10.2.2.4 Climate Action Plan 2025

The Climate Action Plan 2025 ('CAP25') [10] is the third statutory annual update to Ireland's Climate Action Plan, prepared in accordance with the Climate Action and Low Carbon Development (Amendment) Act 2021 [18]. The CAP25 outlines the roadmap to deliver on Ireland's climate ambitions, setting the national climate targets under the Paris Agreement and the European Green Deal to halve Ireland's GHG emissions by 2030 and achieve climate neutrality no later than 2050.

10.2.2.5 Climate Change Risk Assessment

Under the Climate Action and Low Carbon Development (Amendment) Act 2021 [18] as launched by the Minister for the Environment, Climate and Communications, statutory guidelines are in place to assist local authorities in preparing local climate action plans. These guidelines have been issued under the provisions of the Act and are, therefore, statutory in nature for the respective local authorities to complete. These are outlined in *Technical Annex B – Climate Change Risk Assessment* [12].

The technical annex was prepared for local councils to aid in preparing climate vulnerability assessments for their constituents. Section 2.0 – Assessing Current Climate Risks and Impacts of the technical annex details guidelines on assessing current climate impacts for local councils, which involve the following:

- *"Identifying the range of climate hazards that have previously affected your local authority and its administrative area, and,*
- *Assessing the exposures and vulnerabilities of the local authority and its administrative area to these hazards."*

In addition, the EPA's 2024 report, *Ireland's Climate Change Assessment* [9] provides a comprehensive scientific assessment of Ireland's climate trends, impacts and risks to guide climate adaptation and mitigation.

Whilst the Climate Change Risk Assessment has been adopted at the county and national level and is, therefore, on a much larger scale than that of the Proposed Development, the basic premise of identification and classification of hazards will be completed as far as practicable.

10.2.2.6 Regional Spatial and Economic Strategy ('RSES') for the Eastern and Midland Region

County Meath is a part of the Eastern and Midland Regional Spatial and Economic Strategy ('RSES'). The Eastern and Midland Regional Assembly ('EMRA') is responsible for overseeing

the implementation of the RSES in the Eastern and Midland Region, coordinating spatial planning, economic development and climate action across the region.

In addition to economic and development objectives for the Eastern and Midland region, the RSES strives for environmental protection and seeks to combat climate change through the implementation of national Climate Action Plans on a regional level. The RSES 2019-2031 identifies numerous Regional Policy Objectives ('RPOs') for climate change [21], examples of which include:

RPO 7.30: *"Within 1 year of the adoption of the RSES, the EMRA shall seek with other stakeholders to carry out an assessment of transport emissions in the Region to identify GHG forecasting and to analyse the emissions impacts of development in the Region"*;

RPO 7.32: *"With the assistance and support of the Climate Action Regional Offices, local authorities shall develop, adopt and implement local climate adaptation and mitigation strategies which shall address issues including local vulnerability to climate risks and identify and prioritise actions, in accordance with the Guiding Principles of the National Adaptation Framework, National Mitigation Plan"*; and,

RPO 7.41: *"Support and promote structural materials in the construction industry that have low to zero embodied energy & CO_2 emissions".*

In addition, Meath County is a member of the Eastern and Midlands Climate Action Regional Office ('CARO'). The CAROs are established based on geographic and topographic characteristics and aim to enable climate action strategy implementation at a local level.

10.2.2.7 Meath County Development Plan 2021-2027

Meath County Council ('MCC') integrates climate resilience and environmental protection into its Meath County Development Plan ('CDP') 2021-2027. For example, within the Core Strategy ('CS') of the CDP 2021-2027, climate objectives include the following:

CS OBJ 13: *"Support the implementation of the National Climate Change Strategy and the National Climate Change Adaption Framework Building Resilience to Climate Change 2012 through the County Development Plan and through the preparation of a Climate Change Adaptation Plan in conjunction with all relevant stakeholders."*

Further, the Extractive Industry and Building Materials Production section of Chapter 9 of the CDP 2021-2027 outlines MCC's support in the development of rural enterprises, particularly those within the extractive industry, which play a key role in supporting rural communities and contributing to sustainable rural development. The following goal is presented as follows:

"To facilitate adequate supplies of aggregate resources to meet the future growth needs of the County and the wider region while addressing key environmental, traffic and social impacts and details of rehabilitation."

In addition, examples of the rural development policies in place relevant to the extractive industry are as follows:

RD POL 23: *"To support the extractive industry where it would not unduly compromise the environmental quality of the county and where detailed rehabilitation proposals are provided"*; and,

RD POL 24: *"To seek to ensure that the extraction of minerals and aggregates minimise the detraction from the visual quality of the landscape and do not adversely affect the environment or adjoining existing land uses"*.

10.2.2.8 Meath County Council Climate Action Strategy 2019-2025

The Meath Climate Action Strategy 2019-2025 is presented in the Climate Change Strategy chapter of the CDP 2021-2027, which supports local efforts to build a climate-resilient

economy by promoting sustainable practices across transport, buildings, energy and natural resources. Examples of some of the policies and objectives in place to reduce GHG emissions associated with the industrial and commercial sectors, applicable to the Proposed Development, are as follows:

ED POL 15: *"To seek to support and facilitate both existing and new businesses who seek to maximise the re-use and recycling of resources, create new business models and promote innovation and efficiency"*;

ED POL 68: *"To work in partnership with relevant stakeholders to ensure that a sustainable approach is taken to enterprise development and employment creation across all sectors of the Meath economy in accordance with the Green Economy national frameworks relevant to each sector"*; and,

ED OBJ 69: *"Engage with all relevant government stakeholders, enterprise agencies and sectoral representatives in pursuing 'green' approaches to economic development, and actively collaborate with key industry and educational bodies to promote Meath based initiatives across the economic sectors"*.

10.2.2.9 Meath County Council Climate Action Plan 2024-2029

In accordance with the Department of the Environment, Climate and Communications guidelines, *Technical Annex B – Climate Change Risk Assessment* [12], Co. Meath developed a comprehensive Climate Action Plan 2024-2029 ('CAP'), which outlines the measures that MCC will take to reduce energy use and carbon emissions, achieve climate adaptation and resilience, and facilitate stakeholder climate action [3].

The targets of the Meath County Council CAP 2024-2029 are as follows:

- **Energy Efficiency** - 50% improvement in energy efficiency by 2030;
- **Resilience** - Making Meath a climate-resilient region by reducing the impacts of future climate change-related events;
- **GHG Reduction** - 51% reduction in greenhouse gas emissions by 2030; and,
- **Awareness** - Actively engaging and informing citizens, communities and businesses on climate change.

Within the CAP, examples of climate actions related to Sustainability and Resource Management ('SR'), which includes actions to support the circular economy, initiatives and infrastructure related to industry and businesses, for example, as follows:

SR4: *"Engage with businesses and residents to support adoption of reused and recycled materials"*.

10.2.3 Assessing Greenhouse Gas Emissions

Anthropogenic GHG emissions have a global effect when they are released in large quantities into the atmosphere over long periods of time – decades, or longer; therefore, assessing the effects of GHG emissions of a Proposed Development at a local level is inconsequential. GHG emissions are not geographically circumscribed. Even at a national scale, the effect of the GHG emissions of an entire country the size of Ireland has no noticeable effect on the global, national or regional climate as stand-alone emissions. It is cumulative, global anthropogenic GHG emissions that cause noticeable changes in global, national and regional climates.

Nonetheless, given the importance of climate change and the fact that any project will contribute to an increase or decrease in GHG emissions, an assessment is required.

Currently, in Ireland, there is no set methodology for the significance criteria or threshold for GHG emissions for the extractive industry. The quantity of emissions from a quarry depends on the size and type of activities that are occurring within a site.

The primary sources of GHG emissions associated with the Proposed Development will be from the direct emissions associated with HGV and employee movements, fuel use of plant and equipment and electricity consumption.

For the purposes of this assessment, the potential effects of GHG emissions from the Proposed Development were assessed under the following stages (see section 10.4 for more detail):

- Site Preparation;
- Operational Phase; and,
- Restoration Phase.

The above stages will commence in tandem with one another over an operational period of approximately 20 years. For the purposes of this assessment, the Site Preparation Phase is expected to commence in 2026.

Potential GHG emissions from the Proposed Development have been divided into Scope 1, Scope 2 and Scope 3 GHG emissions, as recognised by the ISO 14064 Part 1 Standard [8]. Table 10-3 below details the scopes that were considered for this assessment.

The assessment boundary for assessing GHG emissions will only be associated with activities within the Proposed Development boundary.

According to the International Panel on Climate Change ('IPCC') 2019 refinement of the 2006 publication of *Guidelines for National Greenhouse Gas Inventories* [6] and as recognised by the ISO 14064 Part 1 Standard [8], GHG emissions can be split into three categories or 'scopes'[3], as presented in Table 10-3 below.

Table 10-3: Scoped Emissions used in GHG Assessment

Scope	Description and Source
Scope 1: Direct Emissions	Direct emissions from sources that are owned or controlled by the reporting entity, such as emissions from the combustion of fossil fuels in boilers and vehicles.
Scope 2: Indirect Emissions Associated with the Proposed Development	Indirect emissions associated with energy consumption consumed but not produced by the reporting entity, such as emissions from the generation of purchased electricity, heat or steam.
Scope 3: Indirect Emissions	Other indirect emissions that are considered a consequence of the reporting entity's activities, such as vehicle emissions from transporting materials, products and employees to and from a site.

[3] *Scope 1 Direct Emissions and Scope 2 and 3 Indirect Emissions do not relate to the EIA's Directive of "Direct" and "Indirect" effects and are assessed separately.*

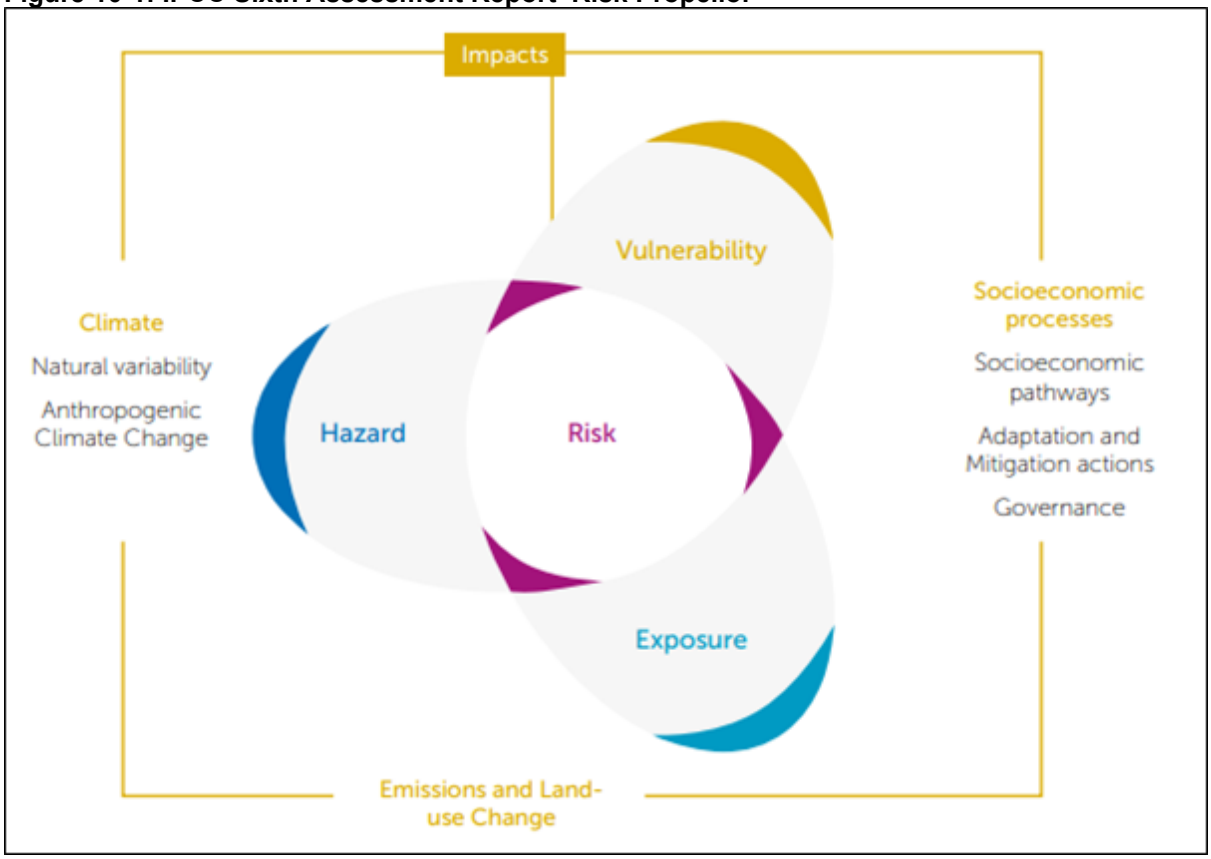
10.2.4 Climate Change Risk Assessment

The IPCC define three key components of a climate risk that interact and combine to generate the risks of climate impact [7]. These include:

- Hazard: The potential occurrence of a natural or a human-induced physical event or trend (such as a heatwave, heavy rainfall event, or sea level rise) that may cause loss of life, injury, or other health impacts, as well as damage and loss to property, infrastructure, livelihoods, service provision, ecosystems and environmental resources;
- Exposure: The presence of people, livelihoods, species or ecosystems, environmental functions, services and resources, infrastructure, or economic, social or cultural assets in places and settings that could be adversely affected (e.g. homes in a flood plain); and,
- Vulnerability: The propensity or predisposition to be adversely affected (e.g. people's underlying health conditions can be worsened by high temperatures or heatwaves).

The methodology, as presented in Figure 10-1 below, displays the framework for identifying potential climate risks associated with a development and, in turn, completing a climate risk assessment.

Figure 10-1: IPCC Sixth Assessment Report 'Risk Propellor'



In adherence to *Technical Annex B – Climate Change Risk Assessment* [12] provided for local councils, the assessment process entails the identification of the characteristics of climate hazards. This involves both the frequency and magnitude of impacts across the "Asset Damage" category.

Given the scale and nature of the Proposed Development, the climate risk assessment will focus exclusively on the physical vulnerabilities of the Proposed Development to climate

hazards, both present and future. According to Technical Annex B, these physical vulnerabilities are described as:

> *"Properties of an asset related to the structure or facilities can exacerbate/reduce the impacts before, during, or after a hazard event, e.g. poor design and construction of building, provision of active cooling."*

The impacts of climate risks that will potentially cause disruption to the delivery of services and functions for the Proposed Development are considered the primary focus of this assessment.

Descriptions of the level of impacts range from Catastrophic (Widespread service failure with services unable to cope with wide-scale impacts) to Negligible (Appearance of threat but no actual impact on service provision). These are further detailed in Appendix 10-1: Climate Vulnerability Assessment. The Magnitude of impact, in accordance with the Annex B Guidelines, will only relate to asset damage, due to the nature of activities on the Site. The magnitude of impact across the asset damage categories ranges from Negligible (impacts can be absorbed) to Catastrophic (Disaster with the potential to lead to shut down or collapse or loss of assets/network). The frequency of these climate hazards ranges from Rare (<1% occurrence in a year, occurs once in over 100 years) to Very Frequent (>100% occurrence in a year, occurs several times in a single year). Full details on these quantitative / qualitative descriptions are presented in Appendix 10-1: Climate Vulnerability Assessment.

Future changes in climate hazards were identified as likely to be of significance if the current climate hazards exposed to the Proposed Development are determined to be significant. A detailed desk-based review of available resources (for example, Met Éireann and Climate Ireland) were used to determine potential climate hazards exposed to the Proposed Development and their projected changes in the future.

10.3 Receiving Environment

10.3.1 Baseline Climate

Ireland's climate is primarily driven by ocean influences, mainly the Atlantic, resulting in maritime climate conditions. This results in relatively warm summers and mild winters. The wettest months of the year typically occur between November and January. The prevailing wind direction is from the southwest, contributing heavily to the wet weather experienced in the spring and warmer temperatures in the summer.

Typically, the climate is weather data averaged over a 30-year period to determine long-term trends in important variables such as temperature, precipitation and wind speed. The period of 30 years is considered long enough to smooth out year-to-year variations. Met Éireann has compiled a set of climate averages for the period 1991 to 2020 as a baseline period for day-to-day weather and climate conditions.

The closest Met Éireann weather station to the Proposed Development is Mullingar Station, located ca. 23km from the Site. However, the station closed in 2007/2008 and is not included in the 1991-2020 average climate dataset.

The next closest weather station with available 30-year averaged data for the 1991-2020 period is Casement, Co. Dublin, located ca. 71.6km from the Proposed Development. Table 10-4 below presents the average climate data for the Casement weather station for the period of 1991-2020.

Table 10-4: Climate Averaged Data from Casement Station (1991-2020)

Variable	1991-2020 Average
Annual mean temperature (°C)	9.9

Variable	1991-2020 Average
Annual rainfall (sum of mean monthly totals in mm)	783.5
Annual mean wind speed (kt/s)	10.1
Mean number of days with gale force winds	12.6
Mean number of days with fog	19.8

Regarding Ireland's observational climate, the annual average temperatures in Ireland are approximately 1.0°C higher than they were in the 20th century, with 2022 being the warmest year in Ireland to date, according to the EPA's 2024 report *Ireland's Climate Change Assessment* [9]. In addition, the Met Éireann 2024 report *Long-term air temperature averages for Ireland 1991-2020* [22] presents the following results from the 1991-2020 period:

- The annual mean air temperature for Ireland for the 1991-2020 period is 9.8°C, showing an increase of approximately 0.7°C compared to the 1961-2020 period; and,
- Based on data from the 1961-2020 period, the annualised increase in mean temperature in Ireland is 0.22°C per decade.

Similarly, the findings from the Met Éireann 2024 report *"Long-term rainfall averages for Ireland 1991-2020"* [23] highlight the following:

- Despite regional variations, annual average rainfall has increased by approximately 7% between the periods 1961-1990 and 1991-2020 across all regions of Ireland, with the greatest increases being seen in the west and north of the country; and,
- A significant increase in summer rainfall has been observed in the 1991-2020 period in comparison to the previous averaging period.

10.3.2 Projected Future Climate Change

Observed changes in Ireland's climate over the last century align with global and regional trends associated with human-induced climate change. Climate projections in Ireland are based on global GHG emission scenarios, predicting the future usage of fossil fuels globally and the corresponding release of GHG gases.

The Representative Concentration Pathway ('RCP') is a trajectory adopted by the IPCC. RCP scenario 4.5 (RCP4.5) represents an intermediate scenario with emissions expected to peak in 2040 and then decline. RCP scenario 8.5 (RCP8.5) is the worst-case scenario approach based on overestimating projected coal outputs. The range of these scenarios provides an intermediate and worst-case estimation of potential environmental changes in response to climate change. Based on this range, the following projections were made regarding Ireland's climate:

- Projected seasonal changes in temperature range from 0.9°C (RCP4.5) to 1.9°C (RCP8.5), with an increase in the duration and intensity of heatwaves expected; and,
- Projected changes in the frequency of very wet days (>30mm of precipitation) range between a 21% increase (RCP4.5) and a 31% increase (RCP8.5).

Projections regarding regional-scale sea-level risk and changes in wind speed require more comprehensive research to determine the long-term trends.

10.3.3 Climate Hazards

According to the IPCC's *Sixth Assessment Report (AR6)*, climate impacts are becoming more severe and are manifesting at an accelerated pace [7]. These impacts can have cascading

effects on both natural and human systems, often interacting with other human activities. The IPCC defines climate risk as the potential for adverse consequences to human and ecological systems, recognising the diverse values and objectives associated with these systems [7].

The MCC Climate Action Plan 2024-2029 identifies the following as the most significant current climate hazards in Co. Meath [3]:

- Heatwaves / Drought;
- Flooding;
- Windstorms;
- Extreme Cold; and,
- Heavy Snowfall;

According to the MCC Climate Action Plan 2024-2029, heatwaves, drought, flooding and windstorms are projected to increase the most in future frequency in Co. Meath, Wicklow [3].

The climate hazards that have the potential to impact the Proposed Development were identified from a desk-based review of available resources, including the Meath Climate Risk Assessment as discussed above. Following this review, the below hazards were identified as relevant to the Proposed Development:

- Cold Snaps;
- Extreme Rainfall;
- Severe Wind;
- Heatwave / Drought;
- Flooding;
- Wildfires; and,
- Landslides.

The Proposed Development is located ca. 64.5km from the coast. Therefore, it is not at risk of coastal flooding or coastal erosion and will not have a direct impact on the Proposed Development. As a result, these climate hazards have been screened out of this climate vulnerability assessment and will not be considered further.

Aspects of some hazard categories, such as ocean acidification and sea level rise, will not have a direct impact on the Proposed Development, due to the nature of activities and its location. As a result, these hazards have been screened out of consideration when identifying the level of risk associated with the Proposed Development.

10.4 Characteristics and Potential Effects of the Proposed Development

GHG emissions will mainly arise from the following activities that will take place at the Proposed Development:

- Movement of HGVs associated with the transport of aggregates to market;
- Use of plant and machinery on-site; and,
- Electricity use.

10.4.1 Site Preparation

As per the description of the Proposed Development in Chapter 3 above, the Site Preparation Phase will occur prior to the commencement of aggregate extraction and will overlap with the

processing and removal of stockpiles during the Operational Phase (see section 10.4.3 below). For the purposes of this assessment, the Site Preparation was assumed to commence in 2026. The Site Preparation works will include the following:

- Construction of replacement ponds within reinstated areas;
- Vegetation clearance; and,
- Removal of topsoil.

Prior to the commencement of aggregate extraction within areas where existing ponds are located, replacement ponds will be constructed within the areas proposed for immediate reinstatement as part of the Site Preparation.

The Site Preparation stage will also include the preparation of a grassland area at the northeastern section of the Site for aggregate processing activities. The existing Site is largely cleared for operational activities, unlike typical greenfield sites. Therefore, the removal of topsoil during the Site Preparation will be limited to the undeveloped greenfield areas in the northeastern section of the Site.

The GHG emissions arising from plant and equipment use during the Site Preparation works will be short-term, with the phase expected to span a duration of ca. 1-2 years. Further, Site Preparation works will use existing ancillary infrastructure as far as practicable, removing the necessity to employ additional equipment.

In addition, there will be no transporting of the removed topsoil offsite, nor additional construction staff employed during the Site Preparation phase. Due to the overlap of the Site Preparation phase with the processing and removal of stockpiles during the Operational Phase, any HGV traffic that may occur during the Site Preparation phase is accounted for in the Operational Phase GHG assessment (see section 10.4.3 below).

Due to the short duration of this phase and the use of a small number of the existing plant on-site, the GHG emissions arising from the Site Preparation phase are considered to be inconsequential to the National Carbon Budget 2026-2030 and relevant Sectoral Emission Ceilings. As such, the effects of GHG emissions associated with the Site Preparation phase were determined to be 'not significant' in the context of the National Carbon Budget 2026-2030 and relevant Sectoral Emissions Ceilings.

10.4.2 Restoration Phase

The Restoration Phase will involve the reinstatement of the future excavation areas and the operational areas of the Quarry. Immediate restoration of sections of the existing Site will take place predominantly in the south and west of the existing Site, in designated reinstatement areas where stockpiles have been removed and no further activity (i.e. stockpile storage and excavation) will be taking place. Immediate restoration works will be carried out in line with the Restoration Plan presented in Chapter 6.

As discussed above, the Restoration Phase works will commence within areas of the Site where future reserves are not sought and will run in tandem with operational activities elsewhere on the Site. Therefore, potential GHG emissions arising from the Restoration Phase have been considered in the assessment of GHG emissions associated with the Operational Phase of the Proposed Development (see section 10.4.3 below).

10.4.3 Operational Phase

The Operational Phase of the Proposed Development is expected to commence in 2026 and span approximately 20 years, including the Restoration Phase but excluding maintenance works afterwards.

As per the description in Chapter 3, the Operational Phase of the Proposed Development includes the following activities:

- Removal of stockpiles across the Site;
- Extension and levelling of the quarry floor north of the Site;
- Deepening and levelling of the quarry floor to the east of the Site; and,
- Continued excavation of sand and gravel aggregates.

Operational GHG emissions that were assessed in this study include the following:

Scope 1

- GHG emissions arising from plant and machinery use associated with in the extension of quarry lands, levelling of the quarry floors and extraction of aggregates; and,
- GHG emissions arising from the movement of HGVs transporting aggregates to market.

Scope 2

- GHG emissions associated with electricity usage.

Scope 3

- GHG emissions arising from the movement of employee vehicles to and from the Site.

For calculating emissions during the Operational Phase, this assessment considered a one-year operational period, within the following operational hours:

- Monday to Friday 07:00 – 19:00; and,
- Saturday 07:00 – 14:00.

Table 10-5 below presents annual GHG emissions arising from the transport of quarried materials from the Proposed Development for one year of the Operational Phase. The Site's HGV fleet is primarily owned by the Applicant, with some vehicles owned by a third party. However, for the purposes of this assessment and due to the unavailability of specific data, it was assumed that all HGVs were owned by the Applicant.

GHG emissions arising from Operational Phase traffic were estimated based on the maximum permitted daily trips from HGVs at the Site of 32 daily return trips (refer to section 3.4.2.2 above).

Additionally, based on information provided by the Applicant, the average HGV journey was estimated at 80km (160km return trip). To reflect typical operational scenarios, in which vehicles generally arrive at the Site empty and depart laden, HGV-related GHG emissions were calculated assuming 80km of outbound travel laden and 80km of return travel unladen using DESNZ emission factors [15].

Table 10-5: Annual GHG Emissions Arising from the Transport of Materials during the Operational Phase of the Proposed Development (Scope 1)

Total HGVs per day	No. of Return Journeys per year*	Total Distance Travelled / Operational Phase per year (km)**	Emission factor 0% laden, 100% laden (kg of CO_2e)***	Total Tonnes CO_2e / Operational Phase per year****
32	9,696	775,680	0% laden = 0.64 100% laden = 0.98	628

**Based on 32 daily round trips.*

***Based on a 303-day operational year.*

****Emission Factor kg of CO_2e per km for All HGVs 0% laden and 100% from DESNZ 2024* [15].

*****Calculated based on 16 trips 0% laden + 16 trips 100% laden for a 303-day operational year.*

The Site uses mains electricity for operation and office facilities, supplied by an ESB sub-station located in the northern section of the Site. The annual average electricity consumption associated with the Operational Phase of the Proposed Development is expected to be 127,100kWh per operational year, obtained from Electric Ireland.

Table 10-6 presents the predicted GHG emissions arising from the average consumption of electricity at the Site during an operational year. The emission factor for quantifying GHG emissions associated with electricity consumption was obtained from SEAI [14].

Table 10-6: Annual GHG Emissions Arising from Annual Electricity Usage (Scope 2)

Annual Average Electricity Usage (kWh)	Electricity Consumption Emission Factor (gCO_2e/Kwh)*	Total Tonnes CO_2e / Operational Phase per year
127,100	254.8	32

**Emission Factor gCO_2e/kWh for electricity consumption 2024 from SEAI* [14].

Table 10-7 below presents the predicted GHG emissions arising from the fuels that will be used in the plant utilised for the Operational Phase of the Proposed Development. All plant and machinery used during the Operational Phase are already utilised on-site.

Predicted GHG emissions arising from operational plant use were calculated based on a 67-hour operational week and a 303-day operational year. However, it should be noted that this approach assumes plant is operating for the entire duration of the operational week, which is unlikely and results in an overestimation of actual overall fuel consumption. Average fuel consumption per plant was estimated based on publicly available information and the MOR Environmental library of data.

Table 10-7: Annual GHG Emissions Arising from Plant Use During the Operational Phase (Scope 1)

Plant Type	Total Operating Hours for Operational Phase per year*	Fuel Use per 1 Plant (litres/hour)	Diesel Emission Factor (kg of CO_2e per litre)**	Total Fuel for Operational Phase (litres)	Total Tonnes CO_2e / Operational Phase per year***
Dry Mobile Screening Plant	3,363	10	3.341	33,633	112
Semi Mobile Crushing Plant	3,363	14	3.341	47,086	157
Tracked Excavators	6,727	18	3.341	121,079	405
Wheel Loaders	6,727	34	3.341	228,704	764
Rock Breakers	6,727	20	3.341	134,532	449
Total Operational Plant Emissions (tCO_2e)					**1,888**

**Based on a 67-hour operational week and 303-day operational year considering total number of plant.*

***Emission Factor for diesel kg of CO_2e per litre taken from TII Carbon Tool* [13].

****Considers emissions from total number of plant.*

There are a total of nine employees travelling to and from the Site during the Operational Phase of the Proposed Development. This will result in ca. two daily trips associated with employees working at the Site. For the purposes of this assessment, it is assumed that no employees will arrive by walking, cycling or using public transport. According to the Central Statistics Office ('CSO') 2022 data, the average Irish person travels a distance of 16.8km to

work each day [24]. This results in a round trip of 33.6km per day, which was applied in this assessment. Similarly to the assessment of operational HGV-related emissions, GHG emissions associated with employee travel are assumed to have a 303-day operational year.

Table 10-8 below presents annual carbon emissions as a result of employees travelling to and from the Proposed Development during the Operational Phase.

Table 10-8: GHG Emissions arising from the Transport of Employees related to the Proposed Development during the Construction Phase (Scope 3)

Total Employee Trips per day	No. of Employee Return Journeys per year*	Total Distance Travelled (km) / Operational Phase (includes return trip)**	Emission Factor (kg of CO_2e per km)***	Total Tonnes CO_2e / Operational Phase per year
18	5,454	91,627	0.218	20

**Based on a 303-day operational year.*

***Based on an average round trip distance of 33.6km per employee for a 303-day operational year*

****Emission Factor kg of CO_2e per km for Medium Car – Average taken from TII Carbon Tool* [13].

The total GHG emissions from one year of the Operational Phase of the Proposed Development were predicted to be ca. **2,568 tonnes of CO_2e** per year**.** This total predicted GHG emissions arising from one year of the Operational Phase of the Proposed Development were compared to one year of the National Second Carbon Budget (2026-2030) and the Transport and Electricity Sectoral Emission Ceilings.

Table 10-9 below presents the GHG emissions arising from one year of the Operational Phase of the Proposed Development as a percentage of one year of the Transport and Electricity Sectoral Emission Ceilings and one year of the National Carbon Budget (2026-2030).

Table 10-9: Total Annual Operational GHG Emissions as % of National Budget and Emission Ceilings

National Carbon Budget / Emission Ceilings	Tonnes of CO_2e	Annual Operational Phase as %tage of Emission Ceiling for 2026 - 2030
National Second Carbon Budget 2026 – 2030	200,000,000	0.006%[Note 1]
Transport Emission Ceiling 2026 – 2030	37,000,000	0.01%[Note 2]
Electricity Emission Ceiling 2026 – 2030	20,000,000	0.001%[Note 3]

Note 1: Percentage presents annual Operational GHG emissions / one year National Second Carbon Budget (2026-2030).

Note 2: Percentage presents annual Operational traffic emissions / one year of Transport Sectoral Ceiling (2026-2030).

Note 3: Percentage presents annual Operational electricity emissions / one year of Electricity Sectoral Ceiling (2026-2030).

Given that the GHG emissions arising from the Operational Phase of the Proposed Development will amount to ca. 0.006%, ca. 0.01% and 0.001% of the National, Transport and Electricity Emission Ceilings, respectively, it can be concluded that the Operational Phase of the Development will have a 'not likely' and 'not significant' effect on the relevant Emission Ceilings.

10.4.4 Climate Vulnerability Assessment

The Climate Vulnerability Assessment determines the potential impacts of climate hazards on the Proposed Development and the frequency of these events. The assessment is attached as Appendix 10-1: Climate Vulnerability Assessment.

To assess the level of risk associated with the Proposed Development, receptors were divided into the following:

- On-site Assets (e.g. plant, equipment and building);
- Inputs (Electricity and Water);
- Outputs (Dairy Processing, Operating Capacity); and,
- Transport Links.

Table 10-10 below identifies the potential impacts to the identified receptors from climate hazards using the 2024 EPA publication *Ireland's Climate Change Assessment ('ICCA')*, *Volume 3* [9].

Table 10-10: Potential Impacts to the Identified Receptors from Climate Hazards

Climate Hazard	Potential Impacts on Proposed Development Receptors
Extreme Rainfall and Flooding	Extreme rainfall can inundate the quarry pit, disrupting extraction activities and requiring extensive dewatering efforts.
	Heavy rainfall can result in the destabilising of quarry walls, increasing the risk of landslides or rock collapse.
	Increase in flow may cause damage to plant and equipment as a result of flooding.
	Saturated ground increases the risk of slope failure, posing a safety risk.
	Increased rainfall can result in the washing of suspended solids from all areas, including stockpiles and roadways causing blocked drainage infrastructure and offsite pollution.
	Flooding can result in suspended solids in run-off, leading to water contamination and sedimentation in nearby waterbodies.
	Increases in groundwater levels may affect infrastructure at the Site.
Severe Wind	Stockpiles of loose material like sand or gravel can be blown away, resulting in loss of product and contamination of surrounding areas.
	Storms and high winds have the potential to damage infrastructure and on-site equipment.
	Strong winds can disrupt the transportation of materials or finished goods.
	High winds may contribute to soil erosion, destabilising quarry slopes and increasing the risk of landslides.
Temperature-related (cold snaps, heatwaves and drought)	Freezing temperatures can put added pressure on machinery and equipment, causing malfunction or becoming difficult to operate. Similarly, extreme heat can cause machinery to overheat.

Climate Hazard	Potential Impacts on Proposed Development Receptors
	Impacts on infrastructure such as ice on surfaces and melting road surfacing.
	Increased sun exposure, heat and severe cold can lead to continuous expansion and contraction of metals and embrittlement of materials such as plastic, rubber and metals, overtime causing weakness and degradation.
	Freezing temperatures result in an increased risk of pipework freezing.
	In increased temperatures, water used in wheel wash systems or in dust control and screening may evaporate more quickly, requiring additional water resources.
	Dry conditions as a result of warmer temperatures or drought may result in increased dust generation, increasing the risk of impact to air quality and contamination of nearby areas.
	Heavy snowfall can halt quarry operations by blocking access roads, covering equipment and creating slippery surfaces that pose a safety risk.
Landslides	Landslides have the potential to cause serious structural damage to quarry infrastructure, including roads, equipment and retaining walls.
	The instability of quarry slopes poses significant risk to workers.
	Landslides can cause erosion, leading to sediment run-off that can contamination of waterbodies.
	Blockage of roads as a result of landslides can cause interruptions to the transportation of materials and site operations.
	Blockage of drainage systems and rivers, leading to flooding.
Wildfires	Extreme heat and flames have the potential to destroy buildings, equipment and infrastructure.
	Ash and debris can contaminate water sources and soil.
	Hazardous and flammable materials stored on-site increases the risk of explosion.
	Wildfires pose a serious health risk, including reduced visibility, smoke inhalation, hazardous material exposure and heat exposure.

10.4.4.1 Frequency of Climate Hazards

Based on the Technical Annex B Guidance on current climate hazards, the frequency of the climate hazards was quantified through an analysis of available information. The frequency scores assigned, rated between 1-5 for each hazard, with five being the most frequent, are justified below.

Table 10-11 presents the frequency of current climate hazards relevant to the Proposed Development. The Mullingar Met Éireann weather station, located ca. 23km from the Proposed

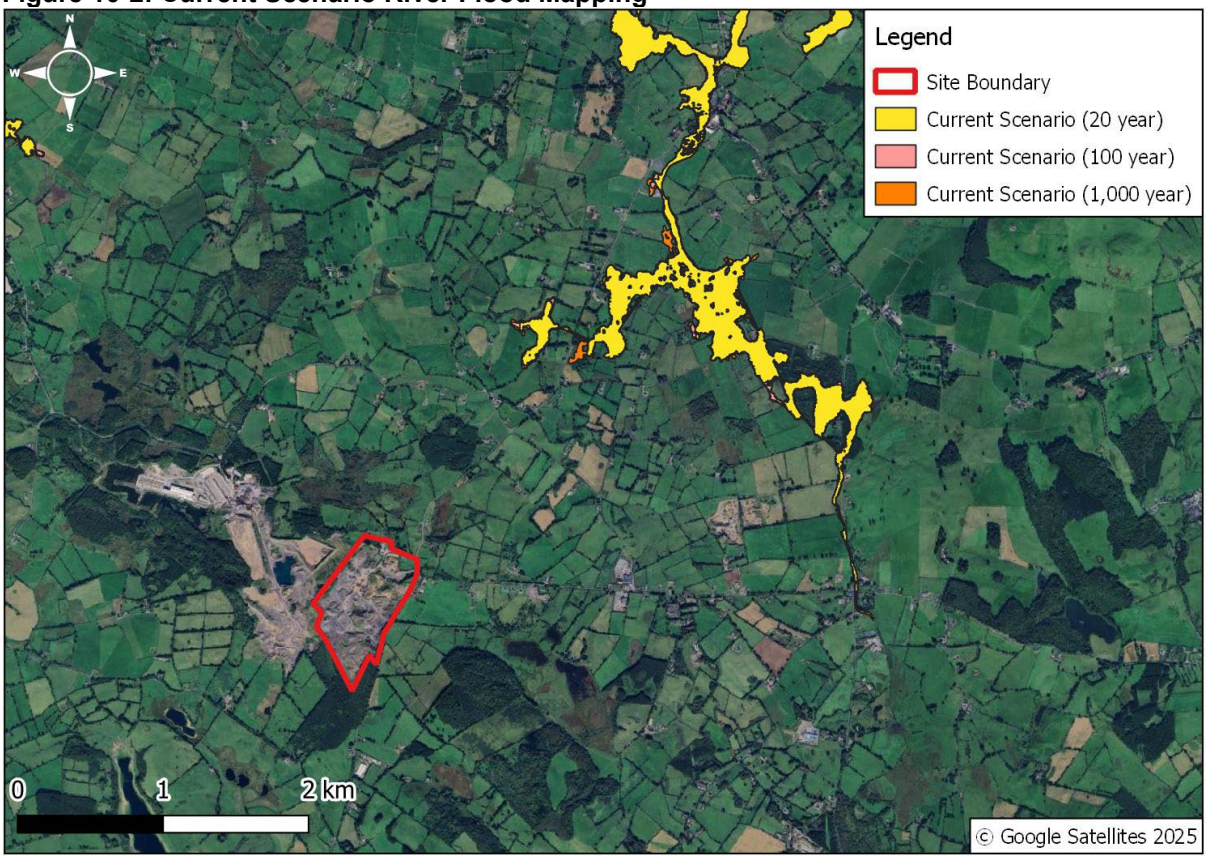
Development, was used to analyse 30 years of meteorological data for the purposes of this assessment.

Table 10-11: Frequency of Current Climate Hazards

Climate Hazard	Current Frequency Score	Current Frequency Description	Justification
Cold Snaps	5	Very Frequent	According to Met Éireann, a yellow weather warning occurs when low temperature reaches -3°C over a widespread area. An orange weather warning occurs when low temperatures are expected to be below -5°C at which point the weather event is *"dangerous weather conditions which may pose a threat to life and property."* Between 1974 and 2024, the Mullingar Station observed 551 yellow and 183 orange low-temperature weather warnings. In addition, Met Éireann defines a red weather warning for low temperatures of -10°C for three consecutive nights or more. One red weather warnings for low temperature was also identified at the station, occurring in 2010.
Extreme Rainfall	3	Common	According to Met Éireann, a yellow weather warning for rainfall occurs when daily precipitation exceeds 30mm. According to the Mullingar Station, 41 yellow weather warnings for rainfall were observed between 1974 and 2024. An orange weather warning for rainfall occurs when daily precipitation exceeds 50mm in a single day, at which point it is considered *"dangerous weather conditions which may pose a threat to life and property"* as defined by Met Éireann. Seven orange rain warnings were observed between 1974 and 2024.
Heatwave / Drought	3	Common	Met Éireann defines heatwaves as five consecutive days with temperatures over 24°C. According to the Mullingar Met Éireann Station, 11 heatwaves occurred between 1974 and 2024.
Severe Wind	3	Common	According to Met Éireann, an orange weather warning for wind occurs when 10-minute mean wind speeds are between 65 and 80km/h or wind gusts are between 110 and 130km/h. Met Éireann defines an orange wind warning as *"Infrequent and dangerous weather conditions which may pose a threat to life and property".* Between 1974 and 2024, there have been 15 orange warning events for 10-minute mean wind speeds and 22 orange warning events for wind gusts observed at the Mullingar weather station. A red weather warning for wind occurs when 10-minute mean wind speeds are more than 80km/h or wind gusts are in excess of 130km/h. Met Éireann defines a Red wind warning as *"Rare and very dangerous weather conditions from intense meteorological phenomena".*

Climate Hazard	Current Frequency Score	Current Frequency Description	Justification
			Between 1974 and 2024, there has been one red warning event for 10-minute mean wind speeds and three red warning events for wind gusts.
Landslides	2	Occasional	According to the GSI Landslide Susceptibility Map [25], there are no recorded landslides within 5km of the Proposed Development. The closest recorded landslide event occurred in the Girley Bog (GSI_LS13-0003), Co. Meath, located ca. 18.3km from the Proposed Development. The landslide susceptibility within the Site boundary ranges from Low (inferred) to Moderately Low, and Moderately Low to High in the southeast of the Site, according to the GSI database [25] (refer to section 7.3.11).
Flooding	1	Rare	The closest waterbodies to the Site are the Rathmea River, located ca. 430m north of the Site boundary, followed by numerous lakes – Togher Lough, Goohertys Lough, Bane North and Bane South – located ca. 440m northwest of the Site. Upon review of the Catchment-based Flood Risk Assessment and Management (CFRAM) Programme for National Indicative Fluvial Mapping – Present Day database [26], the Proposed Development is not located within a flood zone, there are no areas immediately near the Site that are modelled as flood-prone. The National Indicative Fluvial Mapping database shows a Low to Medium flood risk on a section of the Inny_020 river waterbody, located to the north of the Site (refer to Figure 10-2). However, there are no recurring flood events within 2.5km of the Site.
Wildfires	1	Rare	According to the European Forest Fire Information System ('EFFIS') Wildfire Risk Viewer [27], the risk of wildfire in Co. Meath is low.

Figure 10-2: Current Scenario River Flood Mapping



It is important to recognise that there can be co-occurrences of multiple hazards (such as prolonged dry temperatures increasing the risk of wildfires). However, given the small spatial nature of the Proposed Development and the rarity of associated hazards, these impacts are not considered further.

10.4.4.2 Potential Effects of the Current Climate Risks

The impacts of current climate risks will result in the disruption to the delivery of service and function expected to be performed by the Proposed Development. For each of the climate hazards identified, the potential impacts as categorised as "Asset Damage" were determined in accordance with the Technical Annex B Guidelines This quantification of potential impacts was determined for each of the receptors identified, as presented in Table 10-12 below.

Table 10-12: Potential Impacts of Receptors to "Asset Damage" as a Result of Climate Change

Receptor	Climate Hazard	Impact Score	Classified Asset Impact	Justification
On-site Assets (e.g. plant, equipment and buildings)	Severe Wind	1	Negligible	The highest impacts associated with on-site assets would be from extreme rainfall, flooding and landslides. Due to the nature of activities located within a quarry, assets would be particularly vulnerable to water. However, through the on-site canal settlement system and lagoons, surface water run-off is effectively managed, reducing the risk of flooding and impacts from extreme rainfall events across the quarry. The asset damage category of minor is defined as *"an adverse event that can be absorbed by taking business continuity action."*
	Cold Snaps	2	Minor	
	Heatwave/Drought	1	Negligible	
	Extreme Rainfall	2	Minor	
	Flooding	2	Minor	
	Wildfires	1	Negligible	
	Landslides	2	Minor	
Inputs (Electricity and Water)	Severe Wind	3	Moderate	According to the MCC Climate Risk Assessment [4], drought, extreme rainfall and flooding are the climate hazards with the highest impact to water resources in Co. Meath. Water supply used for Site processes is sourced from the on-site recycled water settlement system. Further, potable water used for welfare facilities is obtained from a small on-site well. Therefore, due to the Site's in-land location and independence of mains water, obstructions to water supply due to flooding, extreme rainfall or heatwaves, are less likely to impact the Site's water supply. In addition, the MCC Climate Risk Assessment shows that drought, flooding, extreme rainfall and severe wind have a significant impact to energy supply in Co. Meath. The Site has an ESB sub-station which provides mains electricity
	Cold Snaps	1	Negligible	
	Heatwave/Drought	2	Minor	
	Extreme Rainfall	2	Minor	
	Flooding	2	Minor	

Receptor	Climate Hazard	Impact Score	Classified Asset Impact	Justification
	Wildfires	1	Negligible	for Site operations and consequently, would be more vulnerable to climate-induced power outages. The asset damage category of minor is defined as *"an adverse event that can be absorbed by taking business continuity action."*
	Landslides	1	Negligible	
Outputs	Severe Wind	2	Minor	Due to the nature of activities associated with the Proposed Development (the processing and extraction of earth material), extreme rainfall, flooding and landslides pose the greatest risk to operational output. Extreme rainfall and flooding have the potential to disrupt supply chains through hindered access to and from the Site. The asset damage category of minor is defined as *"an adverse event that can be absorbed by taking business continuity action."*
	Cold Snaps	1	Negligible	
	Heatwave/Drought	1	Negligible	
	Extreme Rainfall	2	Minor	
	Flooding	2	Minor	
	Wildfires	1	Negligible	
	Landslides	2	Minor	
Transport Links	Severe Wind	3	Moderate	MCC Climate Risk Assessment identifies flooding, extreme rainfall and severe wind as having the highest consequence to roads and transport and consequently, transport links associated with the Proposed Development. As mentioned above, the on-site canal settlement system manages surface water run-off, reducing the risk of flooding to roads and transport routes.
	Cold Snaps	3	Moderate	
	Heatwave/Drought	1	Negligible	

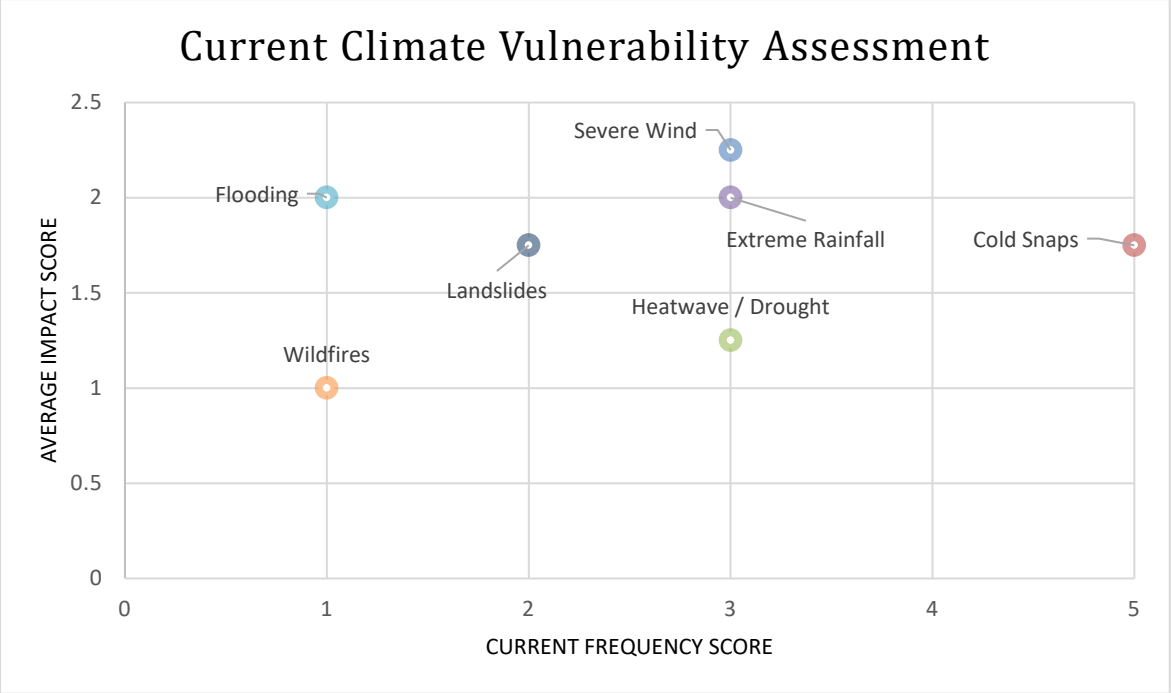
Receptor	Climate Hazard	Impact Score	Classified Asset Impact	Justification
	Extreme Rainfall	2	Minor	Heavy snowfall also causes disruptions to transport links associated with the Proposed Development, causing delays and higher accident risks, including icy or impassable roads, and reduced visibility. Larger vehicles are more at risk of accidents in heavy winds due to their size. Further, road closure as a result of trees or debris will disrupt transport routes. The asset damage category of minor is defined as *"an adverse event that can be absorbed by taking business continuity action."*
	Flooding	2	Minor	
	Wildfires	1	Negligible	
	Landslides	2	Minor	

Based on a qualitative judgement of impacts on assets across all the receptors identified, the frequency and impact score for each hazard was identified and classified for the Proposed Development in Table 10-13 below, with an illustrated graph presented in Figure 10-3 below.

Table 10-13: Summary of Current Climate Impacts for the Hazards Identified

Hazard Type	Current Frequency	Current Frequency Score	Average Impact Score (Across all Receptors)
Cold Snaps	Very Frequent	5	1.75
Extreme Rainfall	Common	3	2
Heatwave/Drought	Common	3	1.25
Severe Wind	Common	3	2.25
Landslides	Occasional	2	1.75
Flooding	Rare	1	2
Wildfires	Rare	1	1

Figure 10-3: Classification of Current Climate Hazards



**Frequency is measured between 1 (Rare) to 5 (Very Frequent). Impact is measured between 1 (Negligible) to 5 (Catastrophic).*

10.4.5 Potential Future Climate Risks

Understanding how climate change risks may evolve in the future is fundamental to identifying how existing risks may change as a result of climate change.

Table 10-14 below presents the future changes in climate hazards expected due to climate change, based on a desk-based review of the Climate Ireland platform [16]. As assets are expected to remain similar throughout the operational phase of the Proposed Development,

the level of impacts from these hazards will remain the same. For a complete understanding of future climate risks, the CMIP Coupled Model Intercomparison Project ('CMIP') climate scenarios outlined by Climate Ireland (RCP4.5 and RCP8.5) for the future period 2021-2050 is discussed.

The Climate Ireland platform was used to determine the potential changes in the frequency of these hazards. All climate hazards were assessed relative to the Proposed Development area as far as practicable. This assessment did not include wildfires and landslides due to a lack of detailed data for projecting future risks associated with these hazards.

Table 10-14: Future Changes in Climate Hazards Expected due to Climate Change

Climate Hazard	Current Frequency Description	Future Frequency Description	Justification
Cold Snaps	Very Frequent	Very Frequent	According to the Climate Ireland platform, under RCP4.5, the number of ice days (where the number of days when maximum temperature is <0°C) is expected to increase by 0.2-6.9 days in the period 2021-2050 compared to the period 1976-2005 (refer to Figure 10-5). Under RCP8.5, the number of ice days is expected to increase by 0.2-6.1 days over the same period (Figure 10-5). Due to the future increase in frequency expected for ice days, the frequency of cold snap hazards will remain "Very Frequent".
Extreme Rainfall	Common	Frequent	According to the Climate Ireland platform, under RCP4.5, the number of days where precipitation will exceed 30mm (classified as a "Very Wet Day") is expected to increase by 0.8-1.1 days (refer to Figure 10-6). Very wet days are expected to increase by 0.8-1 under RCP8.5 (Figure 10-6). Given the increase frequency of rainfall events under future climate change, the frequency of extreme rainfall will upgrade to "Frequent".
Heatwave/Drought	Common	Common	According to the Climate Ireland platform under RCP4.5 and RCP8.5, the area associated with the Proposed Development is expected to increase by 0.07 – 0.1 and 0.15 – 0.2 number of heatwaves, respectively, in the period 2021-2050 compared to the period 1976-2005 (refer to Figure 10-4). Given the relatively low increase to the future frequency of the number of heatwaves, the projected frequency will remain as "Common".
Severe Wind	Common	Common	According to the EPA updated High-resolution Climate Projections for Ireland published in 2024, *"The seasonal projected changes in the standard deviation of 10-m wind speed show small changes for winter, spring and autumn, with large decreases noted for summer."* Further, *"the mean annual 10 m-wind speed is projected to decrease by 0.7—1.7% for SSP126 (2021–2050)".* These changes are not significant, and therefore, the projected frequency will remain the same.

Climate Hazard	Current Frequency Description	Future Frequency Description	Justification
Flooding	Rare	Rare	According to available National Indicative Fluvial Mapping for future scenarios [26], the Proposed Development does not intersect any predicted flood extents or areas at risk of flooding under future flooding scenarios (see Figure 10-7). Further, the nearest predicted flood extent under a High-End future scenario involves fluvial flooding located ca. 400m from the Site. Due to this distance from the Proposed Development, the projected frequency of future flooding will remain the same.

Figure 10-4: RCP4.5 and RCP8.5 Projected Changes in Number of Heatwaves (2021-2050)

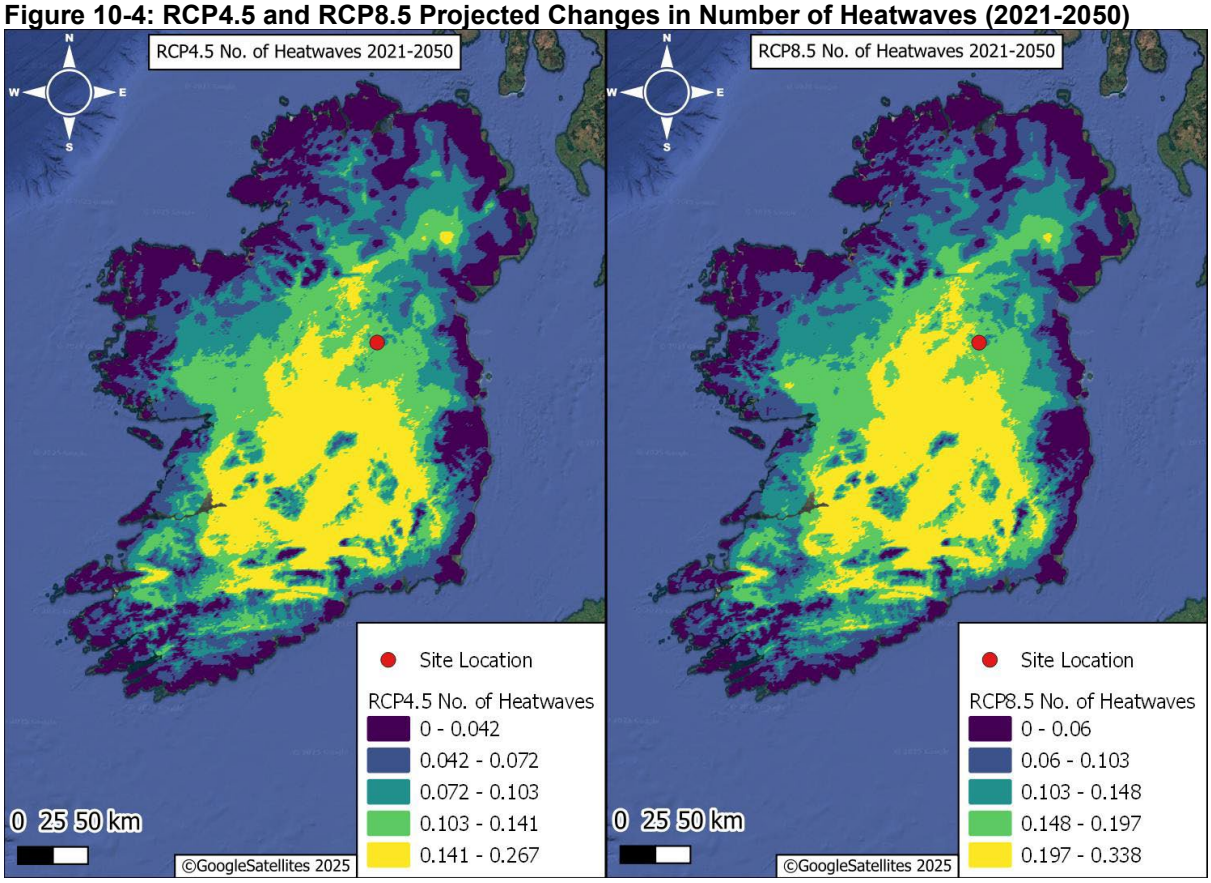


Figure 10-5: RCP4.5 and RCP8.5 Projected Changes in Number of Ice Days (2021-2050)

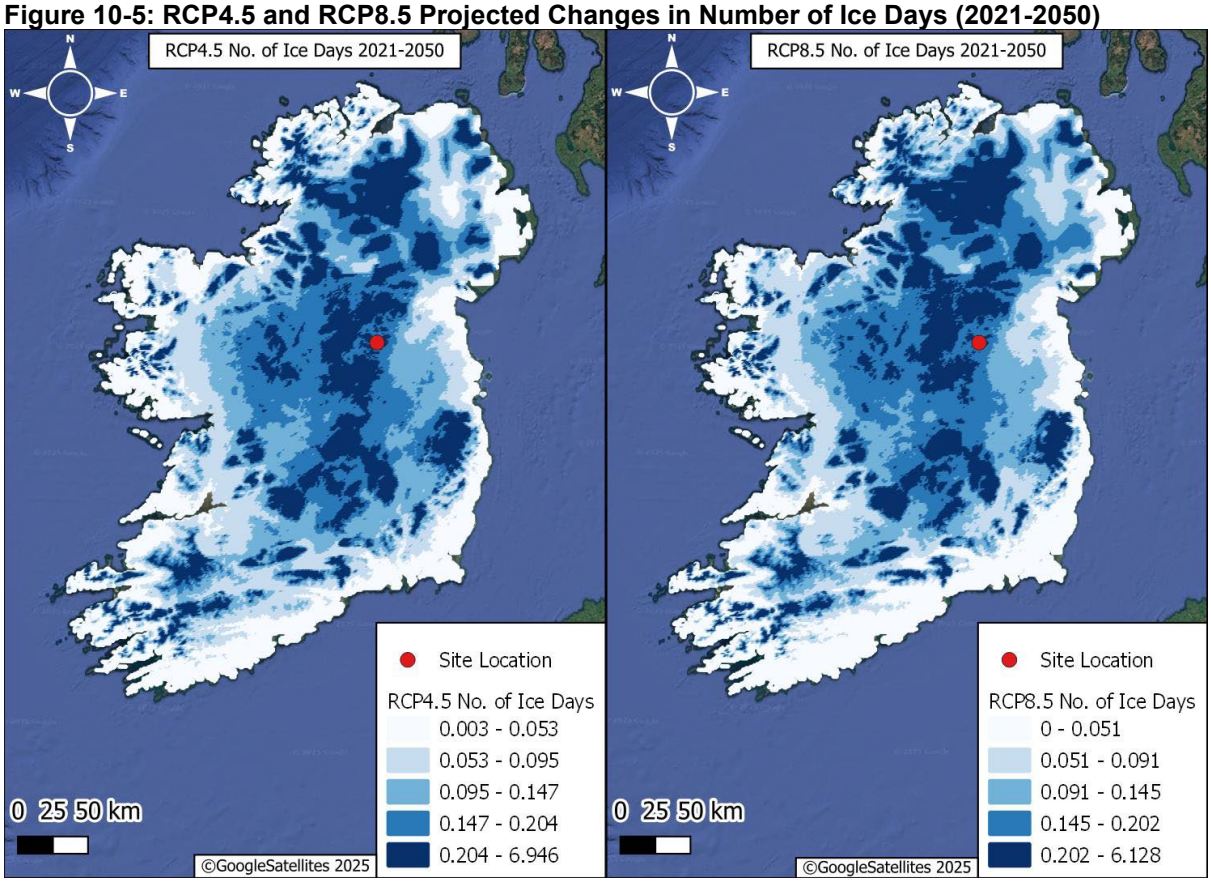


Figure 10-6: RCP 4.5 and RCP8.5 Projected Changes in Number of Very Wet Days (2021-2050)

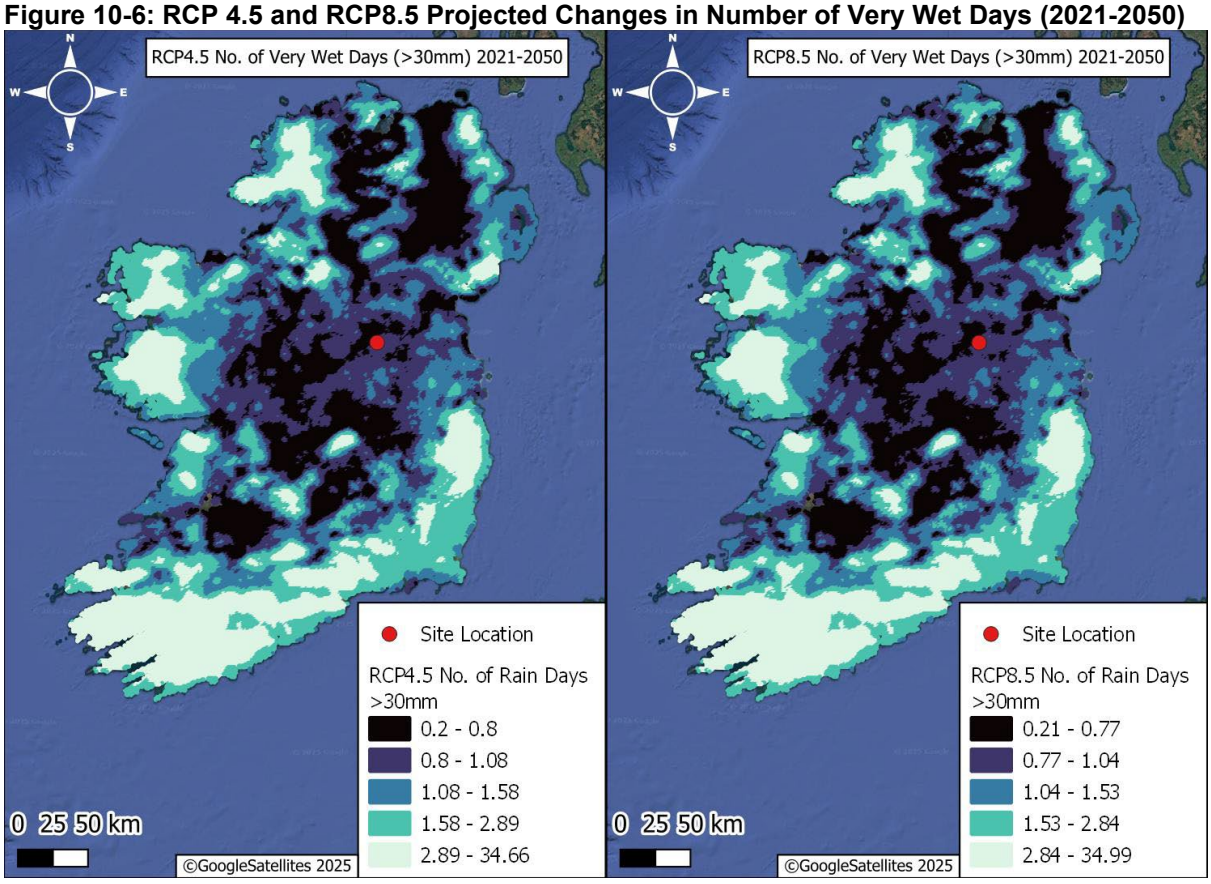
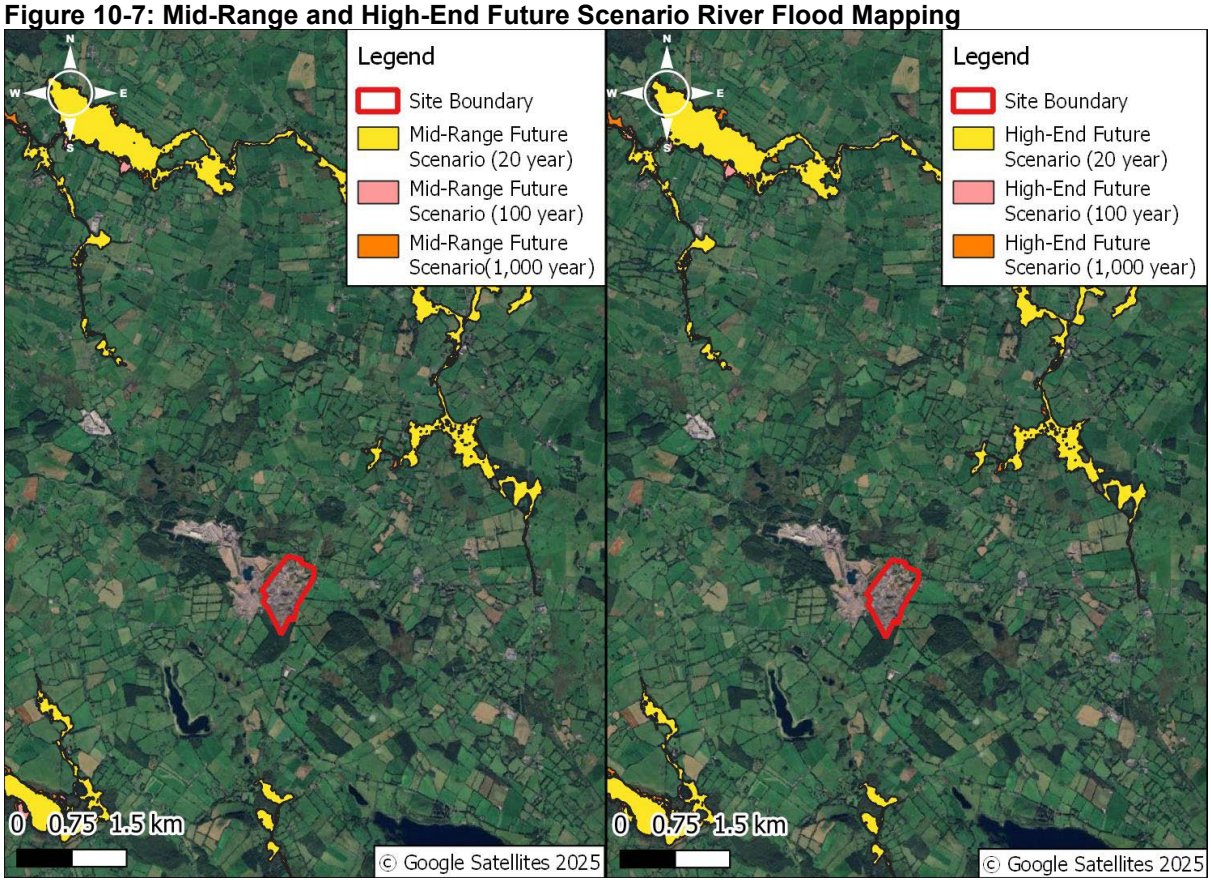


Figure 10-7: Mid-Range and High-End Future Scenario River Flood Mapping



Based on the results of the Climate Vulnerability Assessment, the effects of climate change on the Proposed Development will be 'not likely' and 'not significant'.

10.4.5.1 Unplanned Events

No unplanned events were identified that would have a major impact on GHG emissions associated with the Proposed Development. The only unplanned event that could cause GHG emissions would be fire and explosion. Given the nature of the Site, there are few combustible materials or ignition sources present, as all plant and equipment will be maintained to a high standard of safety. As such, it was considered very unlikely for fire to occur. If such an event did occur, any emissions would be limited and short-term. Therefore, any potential effect in context of GHG emissions and relevant emissions ceilings will be 'not likely' and 'not significant'.

10.5 Proposed Mitigation Measures and/or Other Factors

Given the relatively small activity, due to its nature, size, location and intensity of the Proposed Development, mitigation measures were not considered to be required.

10.6 Cumulative and In Combination Effects

As discussed throughout this chapter, the assessment boundary of this GHG emissions assessment considered the Scope 1, 2 and 3 emissions anticipated as a result of the Proposed Development. The GHG emissions presented in section 10.4.3 above represent a cumulative assessment of the Proposed Development in the context of National and Sectoral Emission Ceilings 2026-2030.

10.7 Interactions and Other Environmental Attributes

The environmental attributes which climate interacts with include:

Chapter 5 – Population and Human Health: Climate change is an important consideration for human health and a pleasant living environment. Concerns about climate change can affect well-being. GHG emissions associated the Proposed Development were shown to have no overall effect on National GHG emissions and, in turn, climate change that can impact human health. This is likely to result in a slight positive effect on the population's well-being and eco-anxiety.

Chapter 6 – Biodiversity: Climate change has the potential to effect ecosystems and biodiversity. However, due to the size and type of the Proposed Development, the influence of GHG emissions associated with the Development was shown to be imperceptible.

Chapter 8 – Water (Hydrogeology & Hydrology): Climate change can have a direct impact on water. Under a changing climate, the frequency of extreme rainfall events is expected to increase. Based on current climate information, the Proposed Development is not vulnerable to flooding.

Chapter 14 – Material Assets: Traffic and Transport: Climate change is directly linked to GHG emissions, with road traffic one of the highest contributors to national emissions. The assessment of GHG emissions arising from employee and HGV vehicles has shown that there was no effect on climate or relevant emissions ceilings as a result of the vehicles associated with the Development. Therefore, the effects were determined to be 'imperceptible'.

10.8 Indirect Effects

There have been no significant or likely indirect effects identified outside of those previously assessed throughout this chapter.

10.9 Residual Effects

The effects on National and Sectoral GHG Emissions Ceilings, considering direct, indirect and cumulative effects, as a result of the Proposed Development, are assessed as not significant, more likely these will be 'imperceptible'.

10.10 Monitoring

No additional monitoring of GHG emissions is required as part of the Proposed Development.

10.11 Reinstatement

The restoration of sections of the existing Site quarry footprint will be carried out as part of the Proposed Development. This will take place predominantly in the south and west of the existing quarry Site and in line with the Reinstatement Plan (see Chapter 6).

10.12 Difficulties Encountered in Compiling this Information

The quantification of GHG emissions as a result of the Proposed Development was conducted as far as practical with the best available data at the time of writing. Where information was not available, the following assumptions and estimations were made based on the MOR Environmental library of data and professional judgement:

- The effects of GHG emissions as a result of the Proposed Development were estimated based on likely delivery destinations for HGVs as provided by the Applicant and national commuting data from the CSO 2022 for employee travel;
- Due to the limited availability of data, it was not possible to quantify the potential future impacts of wildfires and landslides on the Proposed Development.

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FIGURES

TABLES

11 NOISE & VIBRATION

This chapter of the EIAR provides a description and assessment of the likely effect of the Proposed Development on noise and vibration.

In this chapter the following is presented:

- Quantifying the existing ambient and background acoustic / sound environment;
- Quantifying the likely construction and operational noise associated with the Proposed Development;
- Assess the likely significance of effects arising from the Proposed Development; and,
- Outlining the relevant and proportional mitigation measures to the project design.

11.1 Methodology

In preparing this assessment, the following methodologies have been reviewed and, where relevant, applied:

- Department of Environment Heritage and Local Government ('DEHLG') - Quarries and Ancillary Activities: Guidelines for Planning Authorities, 2004 [1];
- EPA 2006, Environmental Management Guidelines, Environmental Management in the Extractive Industry (Non-Scheduled Minerals), 2006 [2];
- BS5228-1:2009+A1:2014, Code of practice for noise and vibration control on construction and open sites, Noise [3];
- SI No 140/2006 Environmental Noise Regulations 2006 [4];
- ANC Guidelines (Greenbook) Environmental noise measurement guide 2013 [5];
- BS4142:2014 Methods for rating and assessing industrial and commercial sound, 2014 [6];
- IEMA Guidelines for environmental noise impact assessment, 2014 [7];
- ISO 1996-1:2016 Acoustics - Description, measurements and assessment of environmental noise - Part 1: Basic quantities and assessment procedures 2003 [8];
- ISO 1996-2:2017 Acoustics - Description, measurement and assessment of environmental noise - Part 2: Determination of sound pressure levels [9];
- NRA Guidelines for the treatment of noise and vibration in National Road Schemes, 2004 [10];
- NRA Good practice guidance for the treatment of noise during the planning of National Road schemes, March 2014 [11];
- Smith, Peterson and Owens Acoustics and Noise Control, 1996 [12];
- World Health Organization's ('WHO') Night noise guidelines for Europe [13];
- World Health Organization's ('WHO') Guidelines for Community Noise [14];
- Meath County Development Plan 2021 -2027; [15]
- Meath Noise Action Plan 2024- 2028 [16];
- Aggregate Levy Sustainability Fund ('ALSF'): Sustainable Aggregates Theme 1 - Reducing the environmental effect of aggregate quarrying: Dust, noise and vibration, year unknown [17]; and,

- Irish Concrete Federation ('ICF') 2005, Environmental Code, Second Edition, October 2005. [18]

This chapter assesses the potential noise effects arising from the Proposed Development through two distinct means.

- An assessment on the likely change in the acoustic environment, as audible at sensitive receptors. This methodology is based on the Institute of Acoustic ('IOA') / Institute of Environmental Management and Assessment ('IEMA') guidelines above; and,
- An assessment on the likely site-specific noise emissions audible and vibration at sensitive receptors rated against standard limits for noise nuisance and vibration from quarries. This methodology is in-line with the EPA and government guidelines above for quarries.

A glossary of terminology utilised within this report is shown in Appendix 11-1.

11.1.1 Legislative and Policy Context

The following sections will review and highlight relevant policies and legislation relating to the Development in the context of national, regional and local objectives on noise.

11.1.1.1 Meath County Council Development Plan 2021-2027

The Meath County Development Plan 2021-2027 [15] details the following policy relating to noise, relevant to the Site:

> ***"Extractive Industry DM OBJ 64:*** *All applications for extractive industry development shall comprehensively address the following criteria as part of a pre-application discussion and/or planning application proposal:*
>
> *Impact on existing local communities with regard to but not limited to noise, vibration and subsidence."*

11.1.1.2 Meath County Council Noise Action Plan (2024-2028)

Regarding extractive industry, the Meath County Council Noise Action Plan states:

> *"Regulation of extractive industries requires Local Authorities to find a balance between facilitating economic growth, creating employment and protecting the natural landscape and local population from unwanted effects of heavy industry. The County Development Plan makes provisions to support extractive industries where it does not unduly compromise the environmental quality of the county. The influence on environmental quality is judged on a number of factors, including noise. Proposals for new developments in particular are required to address the noise impact on local communities in detail in planning proposals. See DM OBJ 62."*

Further details in relation to noise from quarries are outlined under DM Objective 64 of the County Development Plan, as outlined above in section 11.2.1.1.

11.1.2 Quarries and Ancillary Activities

The Department of Environment, Heritage and Local Government ('DoEHLG') issued a guidance document to Local Authorities to assist them in the assessment and regulation of quarries, dated 2004. This guidance specifically outlines information relating to noise to be considered and limits to be applied, which are shown below:

> *'Noise emissions from the facility shall not exceed 55dB(A) $L_{Aeq,30min}$ during the daytime and 45dB(A) $L_{Aeq,15min}$ during the night-time at the façade of the nearest noise sensitive locations, subject to adjustment in the event of a change in the accepted limits for industrial noise.''*

11.1.2.1 Planning

Murrens Quarry was registered under Section 261 in 2005 and was given the reference QY35, with MCC issuing 23 conditions for its operation in 2007. These conditions were imposed under S261(6)(a)(i), which is restricted to pre-1963 developments that, when greater than 5ha, are unlikely to cause a significant environmental impact.

11.1.3 Criteria Noise Impact

The limits outlined here are derived utilising best practice, standards for the industry, planning conditions and industrial standards.

The limits are similar to international criteria for the protection of human health from noise nuisance and protection of human health. These limits were therefore applied as the criteria within this Chapter for noise impact from the Development.

11.1.3.1 Construction Stage

Site preparation phase noise was assessed utilising the British Standard BS5228-1 [3], which is designed for the assessment of noise arising from construction and open sites.

This standard identified a methodology (the ABC method, section E.3.2 of standard) for assigning construction noise limits at Noise Sensitive Receptors ('NSRs') based upon the existing ambient noise levels. An excerpt detailing the ABC method is shown in Table 11-1.

Table 11-1: BS5228 ABC Method for assessing Construction Noise Impact

Assessment category and threshold value period (L_{Aeq})	**Threshold value, in decibels (dB)**		
	Category A[A)]	**Category B[B)]**	**Category C[C)]**
Night-time (23:00-07:00)	45	50	55
Evening and weekends [D)]	55	60	65
Daytime (07:00-19:00) and Saturday (07:00-13:00)	65	70	75

Note 1	A significant effect has been deemed to occur if the total L_{Aeq} noise level, including construction, exceeds the threshold level for the Category appropriate to the ambient noise level.
Note 2	If the ambient noise level exceeds the threshold values given in the table (i.e. the ambient noise level is higher than the above values), then a significant effect is deemed to occur if the total L_{Aeq} noise level for the period increases by more than 3dB due to construction activity.
Note 3	Applied to all residential receptors only.
A)	Category A: Threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are less than these values.
B)	Category B: Threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are the same as Category A values.
C)	Category C: Threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are higher than Category A values.
	19:00-23:00 weekdays, 13:00-23:00 Saturday and 07:00-23:00 Sunday.

This method requires an understanding of the receiving environmental at NSRs to allocate suitable construction noise limits at receiving building facade.

11.1.3.2 Operational Site-Specific Noise

The best guidance for quarry noise control issued by the EPA [2], DoEHLG [1] and by the Irish Concrete Federation [19] detail recommended noise limits of:

- Daytime (i.e. 08:00 to 20:00) $L_{eq,1hr}$ 55dB(A); and,
- Night-time (i.e. 20:00 to 08:00) $L_{eq,1hr}$ 45dB(A).

These values are deemed the industry standard for the proper operation of a quarry to control noise while ensuring necessary aggregates can be removed and processed, while protecting local amenity and sensitivity.

11.1.3.3 Site Associated Road Traffic

The R195 regional road on the east boundary is the primary transport route for HGVs accessing and egressing the Site. The surrounding roads are not major roads as per the Environmental Noise Regulations 2006, and therefore, no strategic noise maps have been developed locally.

Traffic from the Site during the period of the Development was in line with existing traffic movements from the Site. Furthermore, quarry traffic was, and continues to be, constrained to operational daytime hours, removing any associated road traffic noise during the night-time period.

This chapter, based on the following, has not identified significant and likely effects arising from the Development for road traffic noise, and it has therefore been screened out of further assessment:

- Existing road traffic movements are established from the Site;
- No significant change on traffic occurred, refer to Chapter 14 (Material Assets); and,
- No traffic associated with the Site during the night-time period.

11.1.4 Noise Modelling

Noise modelling was carried out using iNoise version 2024.03 software. The noise model has been developed for the Site to incorporate the noise emission sources during the operation of the Development, and the layout of the local environment. The model only assesses Site-specific emissions – i.e., it does not incorporate existing ambient sources such as road traffic.

The model was run utilising ISO 9613 1 & 2 for the basis of sound transmission from source to receiver.

11.1.4.1 Model Calculations

The Noise Model calculation formula is based on ISO 9613 – 1 & 2. Utilising this standard Predictor calculates the noise level as follows:

$$L|t.per = L_{dW} - C_{m,per} - C_{t,per}$$

Where

$$L_{dw} = L_W + D_c - A$$

$L_{lt,per}$ Long-term average octave (or 1/3-octave) SPL during the evaluation period in dB

L_{dw} Equivalent continuous downwind octave (or 1/3-octave) SPL in dB

$C_{m,per}$ Meteorological correction during the evaluation period in dB

$C_{t,per}$ Correction for the active time of the source during the evaluation period in dB

L_W Sound power level in dB(A) per octave (or 1/3-octave), re 1 pW

D_c Directivity correction in dB

A Attenuation (octave-band) in dB per octave (or 1/3-octave)

The attenuation A is calculated as follows:

$A = A_{div} + A_{atm} + A_{gr} + A_{bar} + A_{fol} + A_{site} + A_{hous}$

A_{div} Geometrical divergence in dB

A_{atm} Atmospheric absorption in dB/octave (or 1/3-octave)

A_{gr} Ground effect in dB/octave (or 1/3-octave)

A_{bar} Screening in dB/octave (or 1/3-octave)

A_{fol} Attenuation due to foliage in dB/octave (or 1/3-octave)

A_{site} Attenuation due to installations on an industrial site in dB/octave (or 1/3-octave)

A_{hous} Attenuation due to housing in dB

The modelling inputs and outputs are presented in Appendix 11-2. In developing the model all operational sources are deemed on for the full daytime period, i.e., it is calculated as been on for the full 12-hour period and operating at full duty capacity. In reality, many emissions will operate below duty capacity at times. As such, this model presents a worst-case scenario for most hours.

11.2 Receiving Environment

A review of the locality was conducted utilising OSI online mapping, Google, GeoDirectory Data and Bing Aerial Photography.

Based on this research, NSRs were identified in the locality and are shown in Figure 11-1 and described in Table 11-1. MOR Environmental have not been informed of any noise or vibration complaints or exceedances during the operation of the Development.

Figure 11-1: Location of Noise Sensitive Receptors

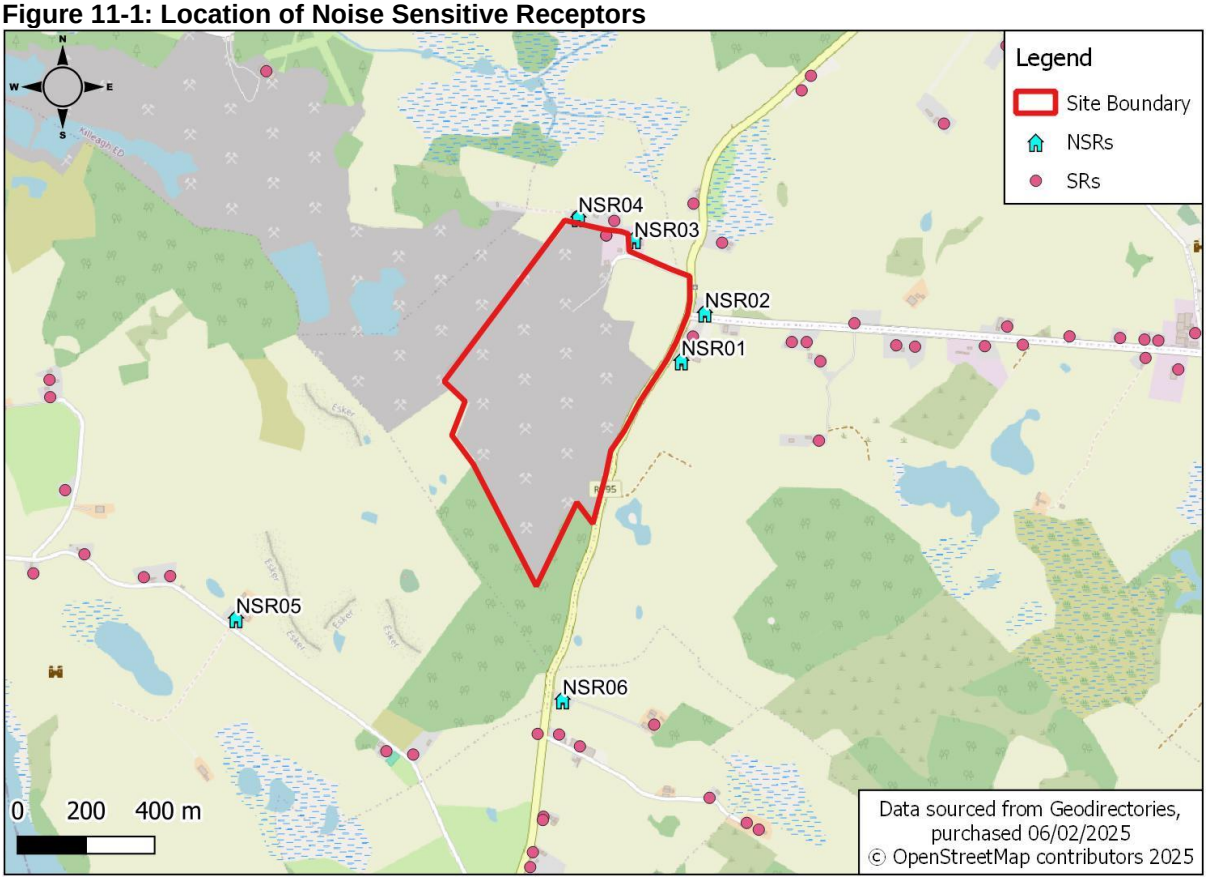


Table 11-2: Identification of Noise Sensitive Receptors (NSRs)

ID	ITM (Easting, Northing)		Location Relevant to Site	Distance from Site Boundary (m)
	E	N		
NSR01	652854	774807	Proxy for dwellings located to the east of the Site.	ca. 42m
NSR02	652923	774946	Proxy for dwellings located to the east of the Site.	ca. 55m
NSR03	652717	775160	Dwelling located to the north of the Site.	ca. 31m
NSR04	652554	775224	Dwelling located to the north of the Site.	ca. 64m
NSR05	651555	774056	Dwelling located to the south of the Site.	ca. 824m

11.2.1 Baseline Ambient Acoustic Assessment

11.2.1.1 Characterisation of the Ambient Acoustic Environment

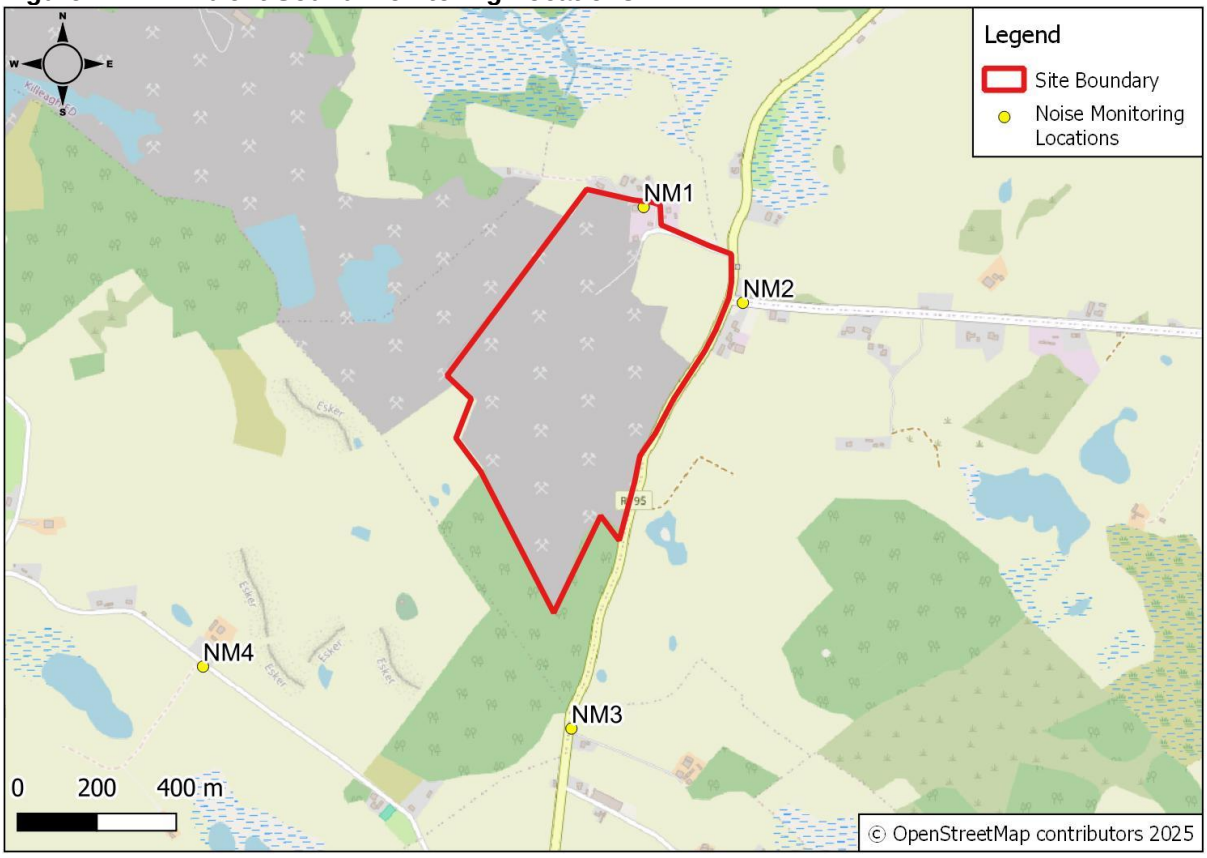
A baseline noise survey was carried out by MOR Environmental on 27th November 2024. The results are presented in Table 11-3 below and the sound monitoring locations are presented in Figure 11-2 below.

Table 11-3: Noise Monitoring Locations

Monitoring Location ID	Easting (ITM)	Northing (ITM)	Description of Locality
NM1	652658	775169	Located within the Site, at the northern boundary.

Monitoring Location ID	Easting (ITM)	Northing (ITM)	Description of Locality
NM2	652908	774928	Located east of the Site ca. 20m off the R195, positioned off local road L6818.
NM3	652476	773857	Located southeast of the Site, on the grass verge of regional road R195.
NM4	651548	774013	Located south of the Site, on verge of local road L68182.

Figure 11-2: Ambient Sound Monitoring Locations



The closest meteorological synoptic station is Mullingar, Co. Westmeath, ca. 23km south of the Site. The summary of the Met Éireann weather data from this synoptic station on the 27th November 2024 of the monitoring event is shown in Table 11-4. Hourly data is presented in Appendix 11-3.

Table 11-4: Met Éireann Summary for Synoptic Weather Station

Date	Rainfall (mm)	Max Temp °C	Min Temp °C	Mean Wind Speed (knots)	Maximum Gusts (if >34 knots)
27/11/2024	0.0	3.4	-4.1	2.1	--

The summary results from the noise monitoring event are shown in Table 11-4. The time duration 'T' for each monitoring event, unless otherwise stated were:

- 30 minutes during the daytime;

Attended measurements were taken twice at each location. This provides 60 minutes of data per location during daytime periods.

Frequency charts along with images from each of the monitoring locations are included in Appendix 11-4.

Table 11-5: Ambient Daytime Sound Levels 2024

Location	Date and Start Time	$L_{Aeq,T}$ (dB)	$L_{A90\ T}$ (dB)	$L_{A10,\ T}$ (dB)	L_{AFmax} (dB)	Description
NM1 Run 1	27/11/2024 11:23	40	32	43	57	Birdsong dominant. Faint off-site noise(W). Site noise from trucks passing at office. Wind speed: 0-1m/s
NM1 Run 2	27/11/2024 11:55	38	32	41	56	Birdsong dominant. Faint off-site noise (W). Site noise from trucks passing at office. Wind speed: 0-1m/s
NM2 Run 1	27/11/2024 12:32	55	35	55	77	R195 Traffic dominant. R195 5-minute traffic count 12:33-12:38= 8 car passes. Tractor pass on one occasion. Truck pass on four occasions. Site reversing alarms on multiple occasions (W). Wind speed: 0-1m/s
NM2 Run 2	27/11/2024 13:03	56	36	57	82	R195 Traffic dominant. R195 5-minute traffic count 13:03-13:08= 6 car passes. Truck pass on two occasions. Site reversing alarms on multiple occasions (W). Wind speed: 0-1m/s
NM3 Run 1	27/11/2024 15:16	66	38	63	88	R195 Traffic dominant. R195 5-minute traffic count 15:24-15:29= 8 car passes. Truck pass on two occasions. Tractor pass on one occasion. Reversing alarms, hammering farmyard property (S). Wind speed: 0-1m/s

Location	Date and Start Time	$L_{Aeq,T}$ (dB)	$L_{A90\ T}$ (dB)	$L_{A10,\ T}$ (dB)	L_{AFmax} (dB)	Description
NM3 Run 2	27/11/2024 15:47	68	41	69	88	R195 Traffic dominant. R195 5-minute traffic count 15:54-15:59= 8 car passes. Truck pass on seven occasions. Reversing alarms, hammering farmyard property (S). Wind speed: 0-1m/s
NM4 Run 1	27/11/2024 14:06	55	30	42	85	Birdsong audible throughout. Tractor pass on nearby road highly audible on one occasion. Distant reversing alarms off-site (NW). Wind speed: 0-1m/s
NM4 Run 2	27/11/2024 14:37	57	29	46	88	Birdsong audible throughout. Car passes on the nearby rural road on four occasions. Tractor pass highly audible on one occasion. Distant reversing alarms off-site (NW). Wind speed: 0-1m/s

Based on the information gathered, it was noted the local ambient acoustic environment was influenced by:

- Agriculture - domestic animals, farm machinery and birdsong;
- Industry - Quarry vehicle movements;
- Transport - traffic noise from local road movements.

Generally higher levels of ambient acoustic sound were found at NM3 due to frequent traffic movement of vehicles near the SLM. NM2 and NM4 recorded higher levels of ambient noise due to traffic passes on the local roads. NM1, located on the northern boundary of the Site, recoded the lowest sound levels, with notable events consisting of occasional HGV movements in or out of the Site

Monitoring location NM1 recorded $L_{Aeq,30min}$ values ranging from 38dB to 40dB. Monitoring locations NM2 and NM4 recorded $L_{Aeq,30min}$ values ranging from 55dB to 57dB. Monitoring location NM3 recorded $L_{Aeq,30min}$ values ranging from 66dB to 68dB.

The background ambient acoustic environment as $L_{A90,30\ min}$ ranged from 29dB to 32dB at monitoring locations NM1 and NM4, with background ambient acoustic environment as $L_{A90,min}$ ranging from 35dB to 41dB at monitoring locations NM2 and NM3.

11.2.2 Conclusion of the Existing Ambient Acoustic Environment

Based on the desk-based review of the area and the baseline survey carried out it is reasonable to conclude that the ambient existing sound levels surrounding the Site are low to moderate.

It is further reasonable to conclude that the levels are in line with historic sound levels based on the limited development or change, and the long operational history of the Site.

11.3 Characteristics and Potential Effects of the Proposed Development

The Proposed Development description is detailed in Chapter 3. The activities assessed in this chapter are concerned with the three different stages, Stage 1, Stage 2 and Stage 3, associated with the Proposed Development. These sources and the potential impacts that will likely occur at NSRs have been discussed separately.

Vibration from Stage 1 of the works is negligible.

11.3.1 Stage 1 - Construction Stage Noise

Noise during Stage 1 of the Proposed Development will consist, as presented in Chapter 3, in Phase 1 – Pond Construction and Phase 2 - Site Preparation. The Stage 1 works required the use of bulldozers or similar unit and excavator for the creation of the ponds.

Table 11-6 below gives typical sound pressure levels ($L_{Aeq,T}$) for typical equipment employed for such works.

Table 11-6: Typical equipment employed for Stage 1

Phase	Plant	Description	Reference (BS5228-1)	Sound Pressure L_{Aeq} dB at 10m
Phase 1	Excavator	Creation of ponds	C.2.02	77
Phase 2	Bulldozer	Clearing of soils	C.2.01	75

Activities that would have had a negligible sound, such as surveying, etc., have been omitted. Similarly, activities that are characteristic of the agricultural area, including fencing and hedgerow maintenance, have not been assessed.

Table 11-7 below details the potential construction noise impact at NSRs, which utilised the BS5228 ABC Method for peak noise, associated with the Stage 1 of the Proposed Development. Creation of ponds (Phase 1) will be located at the west and south areas of the Site. And Phase 2, clearing topsoil, will be conducted in the Extraction Area. The distances from the NSRs to these areas were used in the calculation presented in Table 11-7 below.

The predicted noise levels at the NSRs facades have been compared directly to noise construction limits. Utilising the measured ambient sound levels, the lowest construction limit has been selected within the ABC method.

Table 11-7: Stage 1 Noise Assessment (BS5228 ABC Method)

NSR	Predicted Site Specific Sound Pressure Level at NSR Facade $L_{Aeq,T}$ dB	Measured Ambient Sound Pressure Level $L_{Aeq,T}$ dB	ABC Threshold Compliant for main Site	Compliant with BS5228-1
NSR01	65	55	65	Compliant
NSR02	62	55	65	Compliant
NSR03	58	38	65	Compliant
NSR04	50	38	65	Compliant
NSR05	39	55	65	Compliant
NSR06	41	66	65	Compliant

All NSRs identified will experience less than a $L_{Aeq,1hr}$ of 65dB, due to the distances between NSRs and the site preparation works.

This assessment assumes all on-site plant is operating at the closest point of the areas to these receptors for a constant duration of 1 hour. These values are below the typical construction noise nuisance limit of $L_{Aeq,1hr}$ 65dB.

11.3.2 Stage 2 - Operational Stage Noise

As presented in Chapter 3, Phase 1 will consist of the removal of existing aggregate stockpiles throughout the Site. This will be a gradual process based on aggregate demand. Phase 2 and Phase 3 will continue the extraction activities at the Site to a maximum depth of 119 mOD.

The future acoustic emissions will be similar to ongoing activities within the soft rock quarry. Aggregate processing is the breaking of the larger boulders, the crushing and screening of aggregate and stockpiling of the aggregate and haulage of the aggregate off-site. This is the primary activity within the quarry. No blasting of rock is required or has been undertaken on the Site, nor is it proposed as part of this development.

Table 11-8 presents typical sound pressure ($L_{Aeq,T}$) values for plant utilised within the Site as part of the Stage 2 - Operational of the Proposed Development.

Table 11-8: Stage 2 - Operational Sound Pressure Levels

Plant	Description – typical plant values derived from	Sound Pressure L_{Aeq} at 10m
HGVs	Trucks In	89
HGVs	Trucks Out	83
Tracked Excavator	Tracked Excavator	80

Plant	Description – typical plant values derived from	Sound Pressure L_{Aeq} at 10m
Screening Plant	Semi-mobile screen-stockpiles	81
Screening Plant	Semi-mobile Crushing Plant	80
Loading Shovel	Wheeled loader	90
Pump (Washing Plant)	Pump	68
Screening Plant (Washing Plant)	Screening Plant	72
Rock Breakers	Rock breakers	93

Two peak scenarios have been assessed where the plant is working simultaneously within the Site.

There are two operational models for the Stage 2 of the Proposed Development as presented below:

- Model 01 – Existing operation includes all the plants presented in Table 11-8 operating simultaneously; This model represents the Stage 2 – Phase 1 and 2 presented in Chapter 3 above; and,
- Model 02 – Existing operation of the quarry and extraction at a 120mOD for Extraction Area A and 125mOD Extraction Area B have been modelled using the equipment presented in Table 11-8. This model represents Stage 2 – Phase 2 and 3, presented in Chapter 3 above. Rock breaking will be occurring at a minimum distance of 150m from NSRs, so breakers are not in close proximity to the residences near the Site.

As part of this assessment, two noise models using specialist acoustic software iNoise version 2024.03 have been prepared to assess predicted noise emissions at the Site during the Proposed Development works. The site-specific emissions from the Proposed Development, outlined in Table 11-8 above, are supplied in Table 11-9 below and displayed in Figure 11-3 below for Model 01 and in Table 11-10 and Figure 11-4 for Model 02.

11.3.2.1 Results – Model 01

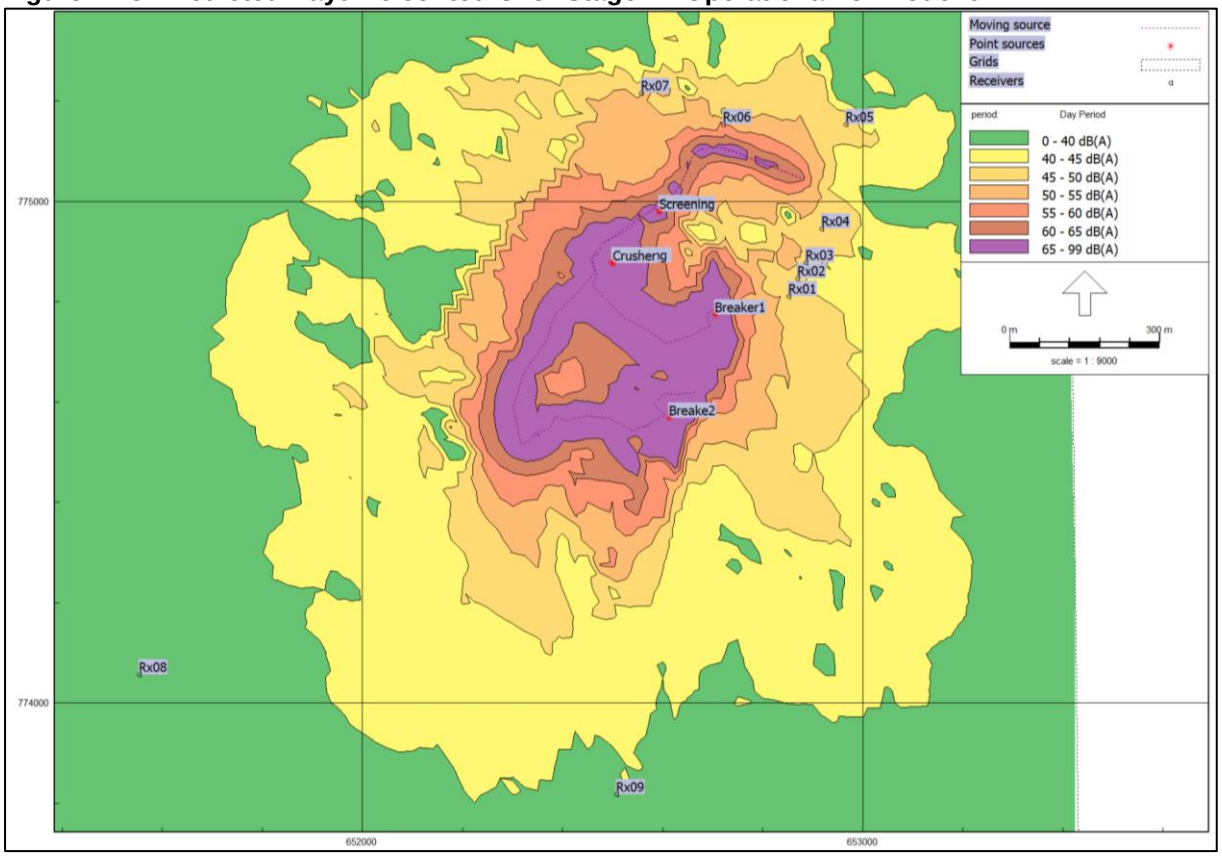
The results for Model 01 are compared against the EPA and DoEHLG recommended limits for daytime. The results presented in Table 11-9 are located at 1.5m height, as the quarry operational hours will be during daytime periods. The results predict an unlikely scenario where all the equipment is working simultaneously.

Table 11-9: Predicted Stage 2- Operational Noise Emissions – Model 01

NSR	Predictor Output $L_{Aeq,1hr}$ (dB)	EPA & ICF L_{Aeq} Limit (dB)	Complaint?
NSR01	48	55	Yes
NSR02	50		Yes
NSR03	53		Yes
NSR04	52		Yes
NSR05	34		Yes
NSR06	40		Yes

All NSRs will be below noise nuisance criteria as outlined in Section 11.1.

Figure 11-3: Predicted Daytime contours for Stage 2 - Operational for Model 01



11.3.2.2 Results – Model 02

The results for Model 02 are compared against the EPA and DoEHLG recommended limits for daytime. The results presented in Table 11-10 are located at 1.5m height, as the quarry only operated during daytime periods. The results predict an unlikely scenario where all the equipment is working simultaneously.

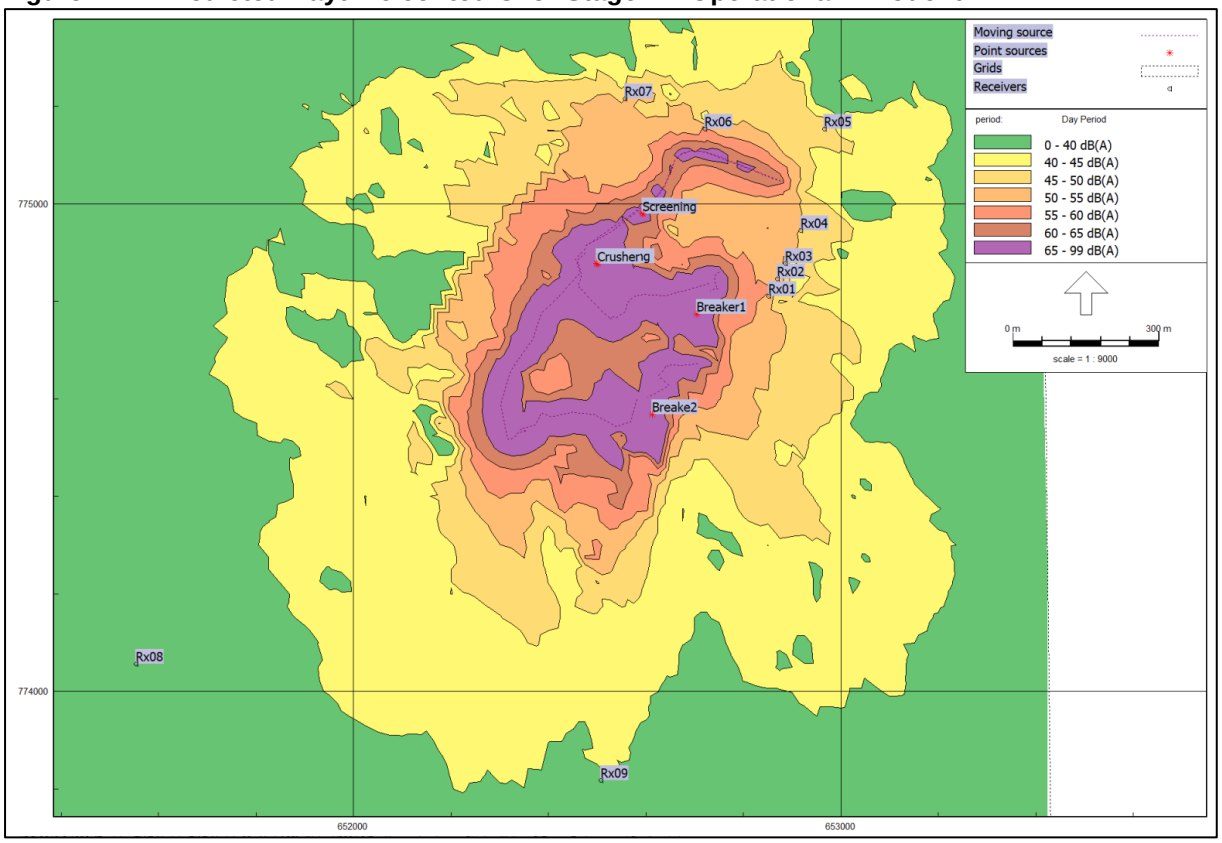
Table 11-10: Predicted Stage 2 - Operational Noise Emissions – Model 02

NSR	Site-specific Output $L_{Aeq,1hr}$ (dB)	EPA & ICF L_{Aeq} Limit (dB)	Complaint?
NSR01	54	55	Yes
NSR02	52		Yes
NSR03	53		Yes
NSR04	52		Yes
NSR05	34		Yes
NSR06	41		Yes

All of the NSRs are predicted to experience a site-specific noise level below noise nuisance of 55dB $L_{Aeq,T}$, as outlined in Section 11.1.4 above. Model 02, as presented above, takes into account that breakers will be located within 150m from the closest NSR. The Site is a soft-rock quarry, and the breakers will be used occasionally during campaigns to break larger rock units removed from the aggregate face.

The character of the future noise will be similar in character as the existing noise presented locally, as the same machinery and plant used for the Proposed Development will be plant operational within the existing development.

Figure 11-4: Predicted Daytime contours for Stage 2 – Operational – Model 02



11.3.3 Stage 3 – Restoration Stage Noise

As presented in Chapter 3, Stage 3 will occur in two Phases. Phase 1 will be the removal of the stockpiles and has been assessed in the Operational Stage assessment. Phase 3 will be Phase 3 will consist in the removal of all plant equipment from the Site. Any future stockpiles of soil which will be stored on Site for restoration purposes will be spread across the Proposed Development area to provide a thin soil layer over the ground.

The activities will be similar to the Site preparation and will be a finite short schedule of works associated with the closure of the quarry, as per the Guidance of DoHLG [88], the rehabilitation phase activities are in line with Stage 1 noise values and noise limits set out in section 11.1.3 above.

Phase 3 will be the last phase for the Restoration plan and will be importing and spreading topsoil. The equipment used in Phase 3 is detailed in Table 11-11 below.

Table 11-11: Stage 3 - Restoration – Sound Pressure Levels

Phase	Plant	Activity	Reference BS5228-1	Sound Pressure L_{Aeq} at 10m dB
Phase 3	Bulldozer	Spreading topsoil;	C.2.01	75
	Tractor	Seed planting and setting of hedgerows	C.4.74	80
	Crane	Removing equipment	C.4.38	78

The predicted levels for Phase 3 for the Stage 3 – Restoration Stage are presented in Table 11-12 below. The distances to the different areas have been considered, to predict a cumulative noise level of all activity occurring simultaneously.

Table 11-12: Predicted Restoration Noise Emissions – Phase3

NSR	Predicted Site Specific Sound Pressure Level at NSR Facade $L_{Aeq,T}$ dB	Measured Ambient Sound Pressure Level $L_{Aeq,T}$ dB	Combined Noise Level (Predicted + Measured Ambient $L_{Aeq,T}$)	Compliant with BS5228-1
NSR01	63	55	63	Compliant
NSR02	60	55	62	Compliant
NSR03	65	38	65	Compliant
NSR04	59	38	59	Compliant
NSR05	44	55	56	Compliant
NSR06	50	66	66	Compliant

All of the NSRs are predicted to be at or below the construction noise nuisance limit of 65dB $L_{Aeq,1hr}$. The peak site-specific emission from the Proposed Development is calculated to be 65dBA at NSR03. This calculation represents a worst-case scenario; here, all the equipment is operating simultaneously during 1 hour. The Proposed Development will not introduce new sound characteristics, nor will the restoration stage present sound qualities typically deemed to be objectionable, such as tonal or clearly impulsive / impact sounds.

Based on the assessment, the predicted impact is deemed to be a not significant short-term impact on a local basis.

11.4 Mitigation Measures and/or Factors

11.4.1.1 Construction Stage - Stage 1 - Noise

The following mitigation measures will be in place during construction:

- Site Preparation works will be designed to avoid noisy work outside the hours of
    - Monday to Friday 07:00 to 19:00; and,
    - Saturday 07:00 to 14:00.
- Work occurring outside these hours will be subject to tighter construction stage noise limits, as per BS5228 (Section 11.1.1.4.1 of this EIAR);
- Nomination of a responsible person to accept and respond to complaints;
- Ensuring all plant and equipment is serviced and in good repair;
- Avoidance of plant or equipment left idling;
- Planning of works to ensure drop heights from equipment are minimised to reduce noise generated; and,
- Noise monitoring programme during construction phase works, refer to section 11.9 below.

11.4.1.2 Operational Stage - Stage 2 - Noise

Plant operating hours will be from 07:00 to 19:00, Monday to Friday and 07:00 to 14:00 Saturdays. No activities will take place on Sundays or Public Holidays.

The equipment associated with the Operational Phase will include both mobile and fixed plant. The following mitigation measures will be in place as part of the Proposed Development:

- All plant (fixed and mobile) is maintained to a high standard to reduce any tonal or impulsive sounds;
- All plant is throttled down or switched off when not in use;
- Internal routes are maintained at minimal gradients and routed to minimise noise emissions from high engine revving.

11.4.1.3 Restoration Stage - Stage 3 - Noise

Plant operating hours will be from 07:00 to 19:00, Monday to Friday and 07:00 to 14:00 Saturdays. No activities will take place on Sundays or Public Holidays.

The equipment associated with the Restoration Phase will be mobile during the operational lifetime within the Site. This will aid in reducing noise emissions from the operations on-site to any individual receptor.

The following mitigation measures will be in place as part of the Proposed Development:

- All plant (fixed and mobile) is maintained to a high standard to reduce any tonal or impulsive sounds;
- All plant is throttled down or switched off when not in use; and,
- Internal routes are maintained at minimal gradients and routed to minimise noise emissions from vehicles on-site.

11.5 Cumulative and In combination Effects

The Proposed Development has been assessed in relation to the potential variation in ambient noise levels and found that any potential effects that might occur would be not significant.

Existing noise emissions, including those associated with the existing operations and activities local to the Site, are incorporated into the ambient noise values utilised in this assessment. There were no notable proposed (currently non-operational) developments identified within 2km from the Site, reducing the potential for cumulative and in-combination effects to occur beyond those fully assessed within the Chapter.

11.6 Interactions with Other Environmental Attributes

Noise is closely linked with human beings, as residential receptors are the primary noise-sensitive receptors, and have been discussed as the primary receptor in this chapter:

- Chapter 5 Population and Human Health: Noise is closely linked with human beings, as residential receptors are the primary noise-sensitive receptors and have been discussed as the primary receptor in this chapter;
- Chapter 6 Biodiversity: Noise can influence fauna through the disturbance of animals. Impacts on specific have been outlined in this chapter where relevant; and,
- Chapter 14 Material Assets Traffic and Transport: Noise and traffic are closely linked. The potential effects from noise arising from traffic associated with the Site have formed an integral part of the assessment.

11.7 Indirect Effects

There have been no significant or likely indirect effects identified outside of those previously assessed throughout this chapter.

11.8 Residual Effects

The residual noise impact, based on the proposed emissions, phasing and intensity of the Site, the mitigation and practices to be employed and within the context of the existing ambient environment, is deemed to be a Slight negative, local and reversible effect during the main operational phase of works.

The Proposed Development will be subject to noise limits for the construction, operation, and restoration phases, and it has been modelled to show that it can comply with them.

11.9 Monitoring

There have been no complaints about noise historically. However, as presented in Section 11.4 and following EPA best practices, annual monitoring will be conducted on-site. Four monitoring locations at boundary positions are deemed sufficient, with locations to be agreed with the Competent Authority prior to the monitoring event. Each monitoring location, in line with best practice, will be assessed for one hour each, with a report prepared by a competent acoustician. This report will be available to the Competent Authority at the Site office and maintained for a minimum of four years.

Monitoring will be undertaken each year from commencement until the restoration works are completed.

11.10 Reinstatement

The Site will be subject to a Restoration Plan following the cessation of extraction on-site. Details of the Restoration Plan are included in Appendix 6-1. These works have been fully assessed in this chapter.

11.11 Difficulties Encountered

There were no difficulties encountered.

11.12 References

[1] DoEHLG, “Quarries and Ancillary Activities,” Department of Environment, Heritage and Local Government, Dublin, 2004.

[2] EPA, “Environmental Management in the Extractive Industry (Non-Scheduled Minerals),” Environmental Protection Agency , Wexford, 2006.

[3] BSI, “BS5228-1:2009+A1:2014 Code of Practice for noise and vibration control on construction and open sites. Noise,” British Standards Authority , London, 2008.

[4] Statutory Instrument, “S.I. 140/2006 Environmental Noise Regulations,” Government of Ireland, Dublin, 2006.

[5] ANC, “ANC Guidelines: Environmental Noise Measurement Guide (Green Book),” Association of Noise Consultants, Suffolk, 2013.

[6] British Standard, “BS4142 2014: Methods for rating and assessing industrial and commercial sound,” British Standard, London, 2014.

[7] IEMA, “Guidelines for Environmental Noise Impact Assessment,” Guidelines for Environmental Noise Impact Assessment, Lincoln, November 2014`.

[8] ISO, ISO 9613-1:1993 Acoustics — Attenuation of sound during propagation outdoors — Part 1: Calculation of the absorption of sound by the atmosphere, Geneva, Switzerland: International Organization for Standardization, 1993.

[9] ISO, ISO 9613-2:1996 Acoustics — Attenuation of sound during propagation outdoors — Part 2: General method of calculation, ISO, 1996.

[10] NRA, “Guidelines for the Treatment of Noise and Vibration in National Road Schemes,” National Roads Authority , 2004.

[11] NRA, “Good Practice Guidance for the Treatment of Noise During the Planning of National Road Schemes,” National Roads Authority, Dublin, March 2014.

[12] B. Smith, R. J. Peters and S. Owen, Acoustics and Noise Control 2nd Edition, London: Prentice Hall, 1996.

[13] WHO, “Night noise guidelines for Europe,” World Health Organization, Copenhagen, 2009.

[14] WHO, Guidelines or Community Noise, Geneva: World Health Organization , 1999.

[15] Meath County Council (MCC), “Meath County Development Plan 2021-2027,” Meath County Council (MCC), 2021-2027.

[16] Meath County Council (MCC), “Meath Noise Action Plan 2024-2028,” Meath County Council (MCC).

[17] ALSF, “Sustainable Aggregates Theme 1 - Reducing the environmental effect of aggregate quarrying: dust, noise and vibration,” London, Aggregate Levy Sustainability Fund.

[18] ICF, “Environmental Code,” 2005. [Online]. Available: http://www.irishconcrete.ie/wp-content/uploads/2017/01/Environmental-Code.pdf.

[19] ICF, “Environmental Code,” 2005. [Online]. Available: http://www.irishconcrete.ie/wp-content/uploads/2017/01/Environmental-Code.pdf.

[20] Statutory Instrument, S.I. No. 549/2018 European Communities (Environmental Noise) Regulations, Government of Ireland, 2018.

FIGURES

TABLES

12 LANDSCAPE AND VISUAL

12.1 Introduction

This chapter of the EIAR consists of a Landscape and Visual Impact Assessment (LVIA), which considers and assesses potential significant effects resulting from quarrying-related activities that have been carried out to date on the Site in question and on its surrounding environment. It was completed by Macro Works Ltd.

12.2 Approach and Methodology

12.2.1 Guidance Documents

Landscape and Visual Impact Assessment is a tool used to identify and assess the effects of change and the significance of these effects resulting from development on both the landscape and people's views and visual amenity.

The following key guidance documents for LVIA and EIAR, namely inform the methodology for remedial assessment of the landscape and visual effects:

- *Guidelines for Landscape and Visual Impact Assessment*, 3rd Edition 2013, (UK Landscape Institute and Institute of Environmental Management and Assessment (IEMA) [1] - hereafter referred to as the GLVIA3;
- Guidelines on the Information to be contained in Environmental Impact Reports (EPA, 2022) [2];
- Advice Notes on Current Practice in the Preparation of Environmental Impact Statements (EPA, 2003) [3]; and,
- Meath County Development Plan 2021 – 2027 (Meath County Council (MCC), 2021) [4].

A key distinction to make in an LVIA is between the landscape effects and the visual effects of development. These are related but assessed separately.

12.2.2 Landscape Impact

Landscape Impact Assessment relates to assessing effects of a development on the landscape as a resource in its own right and is concerned with how the proposal will affect the elements that make up the landscape, the aesthetic and perceptual aspects of the landscape and its distinctive character. The landscape assessment takes account of both physical impacts on the terrain and landcover and the consequence of these for landscape character.

12.2.3 Visual Impact

Visual Impact Assessment relates to assessing the effects of a development on specific views and the general visual amenity experienced by people. This deals with how the surroundings of individuals or groups of people may be specifically affected by changes in the content and character of views due to the change or loss of existing elements of the landscape and/or introduction of new elements. Visual impacts may occur from Visual Obstruction (blocking of a view, be it full, partial or intermittent) or Visual Intrusion (interruption of a view without blocking).

12.2.4 Landscape Assessment Criteria

This part of the LVIA provides an assessment of how the introduction of a development will affect the physical features and fabric of the landscape, and then how the proposals influence landscape character, with reference to published descriptions of character and an understanding of the contemporary character of the landscape as informed through desktop and site studies.

When assessing the potential landscape effects of a development, the value and sensitivity of the landscape receptor are weighed against the magnitude of impact to determine the significance of the landscape effect. The criteria outlined below guide these judgements.

12.2.4.1 Landscape Sensitivity

The sensitivity of the landscape to change is the degree to which a particular setting can accommodate changes or new elements without unacceptable detrimental effects to its essential characteristics. In accordance with GLVIA3, the sensitivity of a landscape receptor (Landscape Character Area or feature) is derived from combining judgements in relation to its susceptibility to change and its value. The judgement reflects such factors as its quality, value, contribution to landscape character and the degree to which the particular element or characteristic can be replaced or substituted. Landscape Sensitivity is classified using the following criteria set out in Table 12-1 below.

Table 12-1: Landscape Value and Sensitivity

Sensitivity	Description
Very High	Areas where the landscape/townscape character exhibits a very low capacity for change. Examples of these include landscapes/townscapes with unique and highly valued elements / character, protected at an international or national level (e.g. World Heritage Site), where the principal management objectives are likely to be protection of the existing character.
High	Areas where the landscape/townscape character exhibits a low capacity for change. Examples of these include landscape/townscapes with rare and highly valued elements / character, protected at a national or regional level, where the principal management objectives are likely to be the conservation of the existing character.
Medium	Areas where the landscape/townscape character exhibits some capacity for change. Examples of which are landscapes/townscapes, that include notable elements / character and are likely to have a designation of protection at a county level or at non-designated local level where there is evidence of local value.
Low	Areas where the landscape/townscape character exhibits reasonable capacity for change. Typically, this would include lower value, non-designated landscapes/townscapes that may also have some elements or features of recognisable quality, where management objectives include, enhancement, repair and restoration.
Negligible	Areas of landscape/townscape character that include derelict sites and degradation where there would be a strong capacity for change. Management objectives in such areas are likely to be focused on enhancement or restoration.

12.2.4.2 Magnitude of Change – Landscape

The magnitude of change is a product of the scale, extent or degree of change that is likely to be experienced as a result of a proposed development and to a lesser extent the duration and reversibility of that effect. The magnitude takes into account whether there is a direct physical impact resulting from the loss of landscape components and/or a change that extends beyond the immediate setting that may have an effect on the landscape character. Table 12-2 below outlines the criteria used to inform this judgement.

Table 12-2: Magnitude of Landscape/Townscape Impacts

Sensitivity	Description
Very High	Change that would be large in extent and scale, involving critically important landscape/townscape elements and patterns, which may also involve the introduction of new uncharacteristic elements or features that contribute to fundamental change of the landscape/townscape, in terms of character, value and quality.

Sensitivity	Description
High	Change that would be large to moderate in extent and scale, involving important landscape/townscape elements and patterns, which may also involve the introduction of new uncharacteristic elements or features that contribute to substantial change of the landscape/townscape, in terms of character, value and quality.
Medium	Changes that are modest in extent and scale, involving notable landscape/townscape elements and patterns, which may also involve the introduction of new, uncharacteristic elements or features that would lead to distinguishable changes in landscape/ townscape character, and quality.
Low	Changes that are small in extent and scale, involving common or indistinct landscape/townscape elements and patterns, which may also involve the introduction of new elements or features that are not uncharacteristic within the receiving context and would lead to subtle changes in landscape/ townscape character, and quality.
Negligible	Changes that are small or very restricted in extent and scale involving common or indistinct landscape/townscape elements and patterns, which may also involve the introduction of new elements or features that are entirely characteristic of the receiving context and would lead to barely discernible changes in landscape/ townscape character, and quality.

12.2.5 Visual Impact Assessment Criteria

This part of the LVIA assesses how the introduction of the Proposed Development will affect views within the landscape. It therefore needs to consider:

- Direct impacts of the Proposed Development upon views through intrusion or obstruction;
- The reaction of viewers who may be affected, e.g. residents, walkers, road users; and
- The overall impact on visual amenity.

It has been deemed appropriate to structure this assessment around a series of representative viewpoint locations. All viewpoints are located within the public domain and are representative of views available from main thoroughfares and pedestrian areas within the vicinity of the Quarry. The selected viewpoints are considered to be comprehensive in communicating the variable nature of the visual effects.

When assessing the potential visual effects of the Proposed Development, the sensitivity of the visual receptor is weighed against the magnitude of the visual impact to determine the significance of the visual effect. The criteria outlined below guide these judgements.

12.2.5.1 Sensitivity of Visual Receptors

As with landscape sensitivity, the sensitivity of a visual receptor is categorised as Very High, High, Medium, Low, and Negligible. Unlike landscape sensitivity however, the sensitivity of visual receptors has an anthropocentric (human) basis. It considers factors such as the perceived quality and values associated with the view, the landscape context of the viewer, the likely activity the viewer is engaged in and whether this heightens their awareness of the surrounding environment.

A list of the factors considered by the assessor in estimating the level of sensitivity for a particular visual receptor is outlined below to establish visual receptor sensitivity at each viewpoint location.

12.2.5.2 Susceptibility of Visual Receptors to Change

In accordance with GLVIA3 [1], visual receptors most susceptible to changes in views and visual amenity are:

- "*Residents at home;*
- *People, whether residents or visitors, who are engaged in outdoor recreation, including use of public rights of way, whose attention or interest is likely to be focused on the landscape and particular views;*
- *Visitors to heritage assets, or to other attractions, where views of the surroundings are an important contributor to the experience;*
- *Communities where views contribute to the landscape setting enjoyed by residents in the area;*
- *Travellers on road, rail or other transport routes where such travel involves recognised scenic routes and awareness of views is likely to be heightened".*
- *Visual receptors that are less susceptible to changes in views and visual amenity include;*
- *"People engaged in outdoor sport or recreation, which does not involve or depend upon appreciation of views of the landscape;*
- *People at their place of work whose attention may be focused on their work or activity, not their surroundings and where the setting is not important to the quality of working life.*

12.2.5.3 Values attached to Views

The value attached to a view is determined by considering the following [1]:

- *Recognised scenic value of the view (Development Plan designations, guidebooks, touring maps, postcards etc). These represent a consensus in terms of which scenic views and routes within an area are strongly valued by the population because in the case of County Developments Plans, for example, a public consultation process is required;*
- *Views from within highly sensitive landscape areas. These are likely to be in the form of Architectural Conservation Areas, which are incorporated within the Development Plan and therefore subject to the public consultation process. Viewers within such areas are likely to be highly attuned to the landscape around them;*
- *Primary views from residential receptors. Even within a dynamic city context, views from residential properties are an important consideration in respect of residential amenity;*
- *Intensity of use, popularity. This relates to the number of viewers likely to experience a view on a regular basis and whether this is significant at a national or regional scale;*
- *Provision of vast, elevated panoramic views. This relates to the extent of the view on offer and the tendency for receptors to become more attuned to the surrounding landscape at locations that afford broad vistas;*
- *Sense of remoteness and/or tranquillity. Receptors taking in a remote and tranquil scene, which is likely to be fairly static, are likely to be more receptive to changes in the view than those taking in the view of a busy street scene, for example;*
- *Degree of perceived naturalness. Where a view is valued for the sense of naturalness of the surrounding landscape it is likely to be highly sensitive to visual intrusion by distinctly manmade features;*
- *Presence of striking or noteworthy features. A view might be strongly valued because it contains a distinctive and memorable landscape / townscape feature such as a cathedral or castle;*

- *Historical, cultural and / or spiritual significance. Such attributes may be evident or sensed by receptors at certain viewing locations, which may attract visitors for the purposes of contemplation or reflection heightening the sense of their surroundings;*
- *Rarity or uniqueness of the view. This might include the noteworthy representativeness of a certain landscape type and considers whether the receptor could take in similar views anywhere in the broader region or the country;*
- *Integrity of the landscape character. This looks at the condition and intactness of the landscape in view and whether the landscape pattern is a regular one of few strongly related components or an irregular one containing a variety of disparate components;*
- *Sense of place. This considers whether there is special sense of wholeness and harmony at the viewing location;*
- *Sense of awe. This considers whether the view inspires an overwhelming sense of scale or the power of nature.*

Those locations which are deemed to satisfy many of the above criteria are likely to be of higher sensitivity, and no relative importance is inferred by the order of listing.

It is recognised that a viewer's interpretation and experience of the landscape can have preferential and subjective components. Where relevant, judgements are made on those elements of the landscape that are considered to contribute more prominently and positively to the visual landscape resource as well as those elements that contribute negatively. Overall sensitivity may be a result of a number of these factors or, alternatively, a strong association with one or two in particular.

12.2.6 Magnitude of Change – Visual

The magnitude of change is again a product of the scale, extent, or degree of change that is likely to be experienced as a result of a proposed development. This is directly influenced by its 'visual presence / prominence', as experienced by visual receptors in the landscape. These terms are somewhat quantitative in nature and essentially relate to how noticeable or 'dominant' a proposal is within a particular view. Aside from the obvious influence of scale and distance, a development's visual presence is influenced by the extent and complexity of the view, contextual movement in the landscape, the nature of its backdrop and its relationship with other focal points or prominent features within the view. It is often, though not always, expressed using one of the following terms: Minimal; Sub-dominant; Co-dominant; Dominant; Highly dominant. Criteria used to inform judgements are provided in Table 12-3 below.

Table 12-3: Magnitude of Change - Visual

Criteria	Description
Very High	Complete or very substantial change in view, dominant, involving complete or very substantial obstruction of existing view or complete change in character and composition of baseline, e.g., through removal of key elements.
High	A major change in the view that is highly prominent and has a strong influence on the overall view. This may involve the substantial obstruction of existing views or a complete change in character and composition of baseline, e.g. through removal of key elements or the introduction of new features that would heavily influence key elements.
Medium	Moderate change in view: which may involve partial obstruction of existing view or partial change in character and composition of baseline, i.e., pre-development view through the introduction of new elements or removal of existing elements. Change may be prominent but would not substantially alter scale and character of the surroundings and the wider setting. View character may be partially changed through the introduction of features which, though uncharacteristic, may not necessarily be visually discordant.

Criteria	Description
Low	Minor change in baseline, i.e. pre-development view - change would be distinguishable from the surroundings whilst composition and character would be similar to the pre change circumstances.
Negligible	Very slight change in baseline, i.e. pre-development view - change would be barely discernible. Composition and character of view substantially unaltered.

12.2.7 Significance of Effect

The significance of a landscape or visual effect is based on a balance between the sensitivity of the receptor and the magnitude of change. It is categorised as Profound, Substantial, Moderate, Slight, or Imperceptible. Intermediate judgements are also provided to enable an effect to be more accurately described where relevant. 'No Effect' may also be recorded as appropriate where the effect is so negligible it is not noteworthy.

The significance category judgement is obtained using the Significance Matrix shown in Table 12-4 below as a guide. This applies the principle of significance being a function of magnitude weighed against sensitivity but employs slightly different terminology that avoids the potentially confusing use of the term 'significant' (as recommended by GLVIA3 Statement of Clarification 1/13 (Landscape Institute, 10th June 2013)).

Table 12-4: Significance Matrix for Landscape Visual Effect

	Sensitivity of Receptor				
Scale/Magnitude	**Very High**	**High**	**Medium**	**Low**	**Negligible**
Very High	Profound	Profound-substantial	Substantial	Moderate	Slight
High	Profound-substantial	Substantial	Substantial-moderate	Moderate-slight	Slight-imperceptible
Medium	Substantial	Substantial-moderate	Moderate	Slight	Imperceptible
Low	Moderate	Moderate-slight	Slight	Slight-imperceptible	Imperceptible
Negligible	Slight	Slight-imperceptible	Imperceptible	Imperceptible	Imperceptible

The significance matrix in Table 12-4 above provides an indicative framework from which the significance of impact is derived. The significance judgement is ultimately determined by the assessor using professional judgement. Due to nuances within the constituent sensitivity and magnitude judgements, this may be up to one category higher or lower than indicated by the matrix. Judgements indicated in light blue (substantial and above) are considered to be 'significant impacts' in EIA terms (see Figure 1-5).

Indicative criteria descriptions used in relation to the significance of effect category are presented in Table 12-5 below.

Table 12-5: Indicative Significance of Effect Criteria Description

	Landscape	Visual
Profound	There are notable changes in landscape characteristics over an extensive area or a very intensive change over a more limited area.	The view is entirely altered, obscured or affected.
Substantial	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the landscape. There are notable changes in landscape characteristics over a substantial area or an intensive change over a more limited area.	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the visual environment. The proposal affects a large proportion of the overall visual composition, or views are so affected that they form a new element in the physical landscape.
Moderate	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends. There are minor changes over some of the area or moderate changes in a localised area.	An effect that alters the character of the visual environment in a manner that is consistent with existing and emerging trends. The proposal affects an appreciable segment of the overall visual composition, or there is an intrusion in the foreground of a view.
Slight	An effect which causes noticeable changes in the character of the landscape without affecting its sensitivities. There are minor changes over a small proportion of the area or moderate changes in a localised area or changes that are reparable over time.	An effect which causes noticeable changes in the character of the visual environment without affecting its sensitivities. The affected view forms only a small element in the overall visual composition or changes the view in a marginal manner.
Imperceptible	An effect capable of measurement but without noticeable consequences. There are no noticeable changes to landscape context, character or features.	An effect capable of measurement but without noticeable consequences. Although the development may be visible, it would be difficult to discern resulting in minimal change to views.

It is important that the likely effects of a proposal are transparently assessed and understood in order that the determining authority can bring a balanced, well-informed judgement to bear when making a planning decision.

As such, whilst the significance matrix and criteria provide a useful guide, the significance of an effect is ultimately determined by the landscape specialist using professional judgement, and also in the context of occasionally using hybrid judgements to account for nuance.

Effects assessed as 'Substantial' or greater (shaded cells) are considered to be the most notable in landscape and visual terms and may be regarded as 'Significant' (see Figure 1-5), albeit it is important to note that this is not a reflection on their acceptability in planning terms.

12.2.8 Quality of Effect

In addition to assessing the significance of landscape and visual effects, the quality of the effects is also determined. Within this LVIA, effects are described as negative/adverse, neutral, or positive/beneficial, and the following criteria has been used to guide these judgements.

- Positive/beneficial - A change which improves the quality of the environment, enhancing the existing view/landscape;
- Neutral - No effects or effects that are imperceptible, within normal bounds of variation e.g. will neither detract from nor enhance the existing view/landscape;

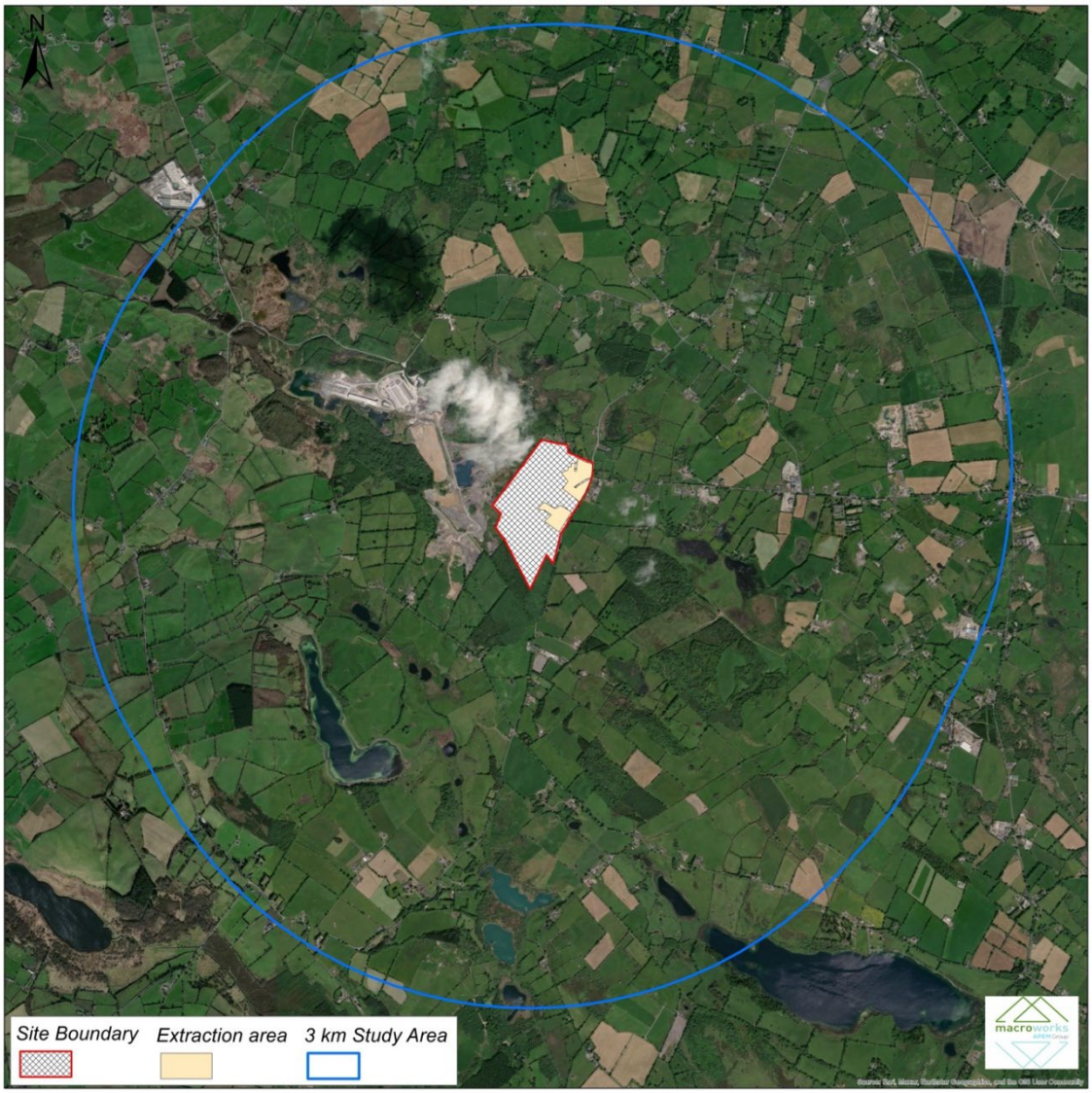
- Negative/adverse - A change which reduces the quality of the environment, detracting from the existing view/landscape

In the case of mineral extraction developments within rural and semi-rural settings, the landscape and visual change brought about by the change to the landform is seldom considered to be positive/beneficial. Effects in these contexts are generally considered to be adverse in nature or neutral, where the effect has little influence on the landscape/views.

12.2.8.1 Study Area

From previous LVIA studies on quarry projects similar to the Proposed Development, a study area of 2-3 km has frequently been adopted. However, the potential to generate significant impacts will typically reduce considerably after 1 km. Out of an abundance of caution, a study area of 3 km radius from the Quarry Site will be used in this instance. See Figure 12-1 below.

Figure 12-1: Study Area



12.3 Policy Context

12.3.1.1 Meath County Development Plan 2012-2027

Landscape Character

A landscape character assessment for County Meath was carried out on behalf of MCC in 2007 and has been incorporated within the Meath CDP 2021-2027 [4]. It divides the county into four main Landscape Character Types (LCT). These are described as *"generic areas of distinctive character which may occur in several places across the County… similar in terms of overall characteristics although the condition and quality of their individual components may vary."*

The quarry development is located within the "Hills and Upland Areas" LCT, which is described as follows:

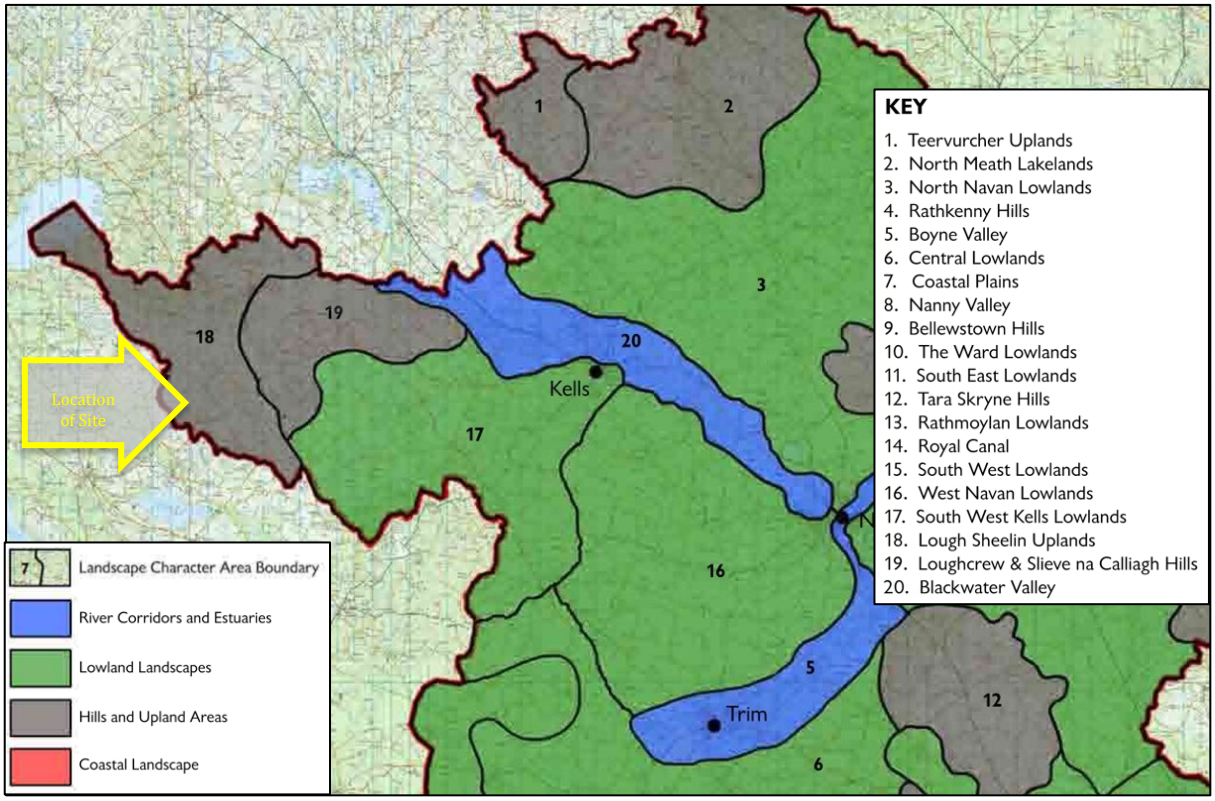
> *"Although Meath is not blessed with dramatic peaks, hills and uplands are a prominent feature of the County, particularly in the northwest. From the tops of these hills panoramic views of the lowland landscapes of Meath and adjacent counties are gained. The hills also act as orientating features."*

A number of general recommendations are given in relation to this LCT. The most relevant points include:

- *"To have due regard to the positive contribution that views across adjacent lowland areas and landmarks within the landscape make to the overall landscape character.";*
- *"To respect the remote character and existing low-density developments in these LCTs."; and,*
- *"To continue and encourage the improved management of field boundaries such as hedgerows and stone walls and hunting copses/ wooded copses."*

The LCTs are then further sub-divided into 20 geographically distinct Landscape Character Areas (LCAs). The quarry site falls within LCA18, the Lough Sheelin Uplands – see Figure 12-2 below.

Figure 12-2: Landscape Character Area at the Site (Meath CDP)



The Lough Sheelin Uplands are identified as having 'High' Landscape Value, 'High' Landscape Sensitivity and 'Regional' Landscape Importance (see Figure 12-3 below). The LCA is described as follows:

> *"Although remote and detached from major settlements, this LCA is rich with visible historic evidence of longstanding use and settlement. Perhaps most importantly this LCA forms the setting for the Loughcrew Hills on which there are a range of passage tombs dating from around 3000BC. There are other prehistoric and pre-Christian sites in the area as well as Anglo-Norman castles and 18th Century estate farms."*

The key characteristics of the LCA are broken into different subheadings, including its geology, land use and ecology. The presence of both "*past and present quarrying sites*" is noted as one of the principal land uses in the area. It is mentioned as having been an important factor in the geology of the area, helping in the creation of *"a complex landform of hills, lakes and enclosed valleys that restrict long range views in many instances."*

In terms of the listed 'Forces for Change' for the LCT, none pertain to quarrying and/or extractive activities.

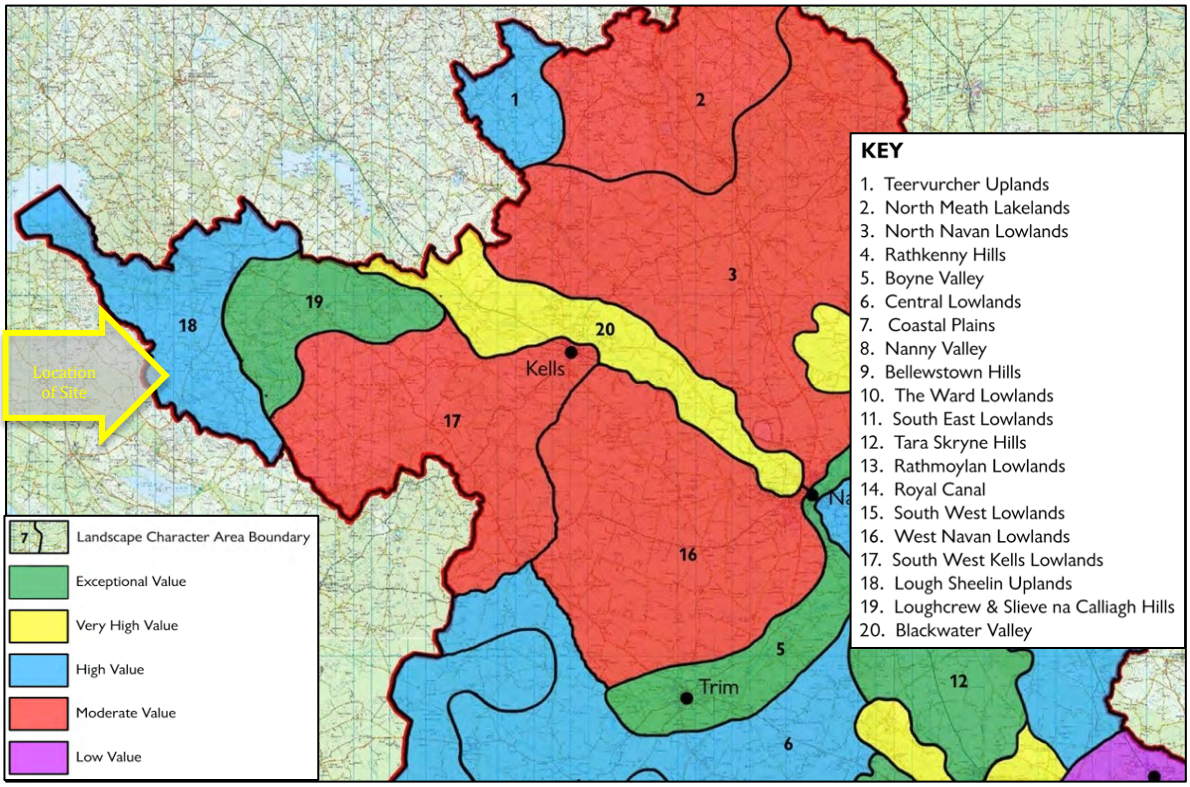
As noted in its description, the Lough Sheelin Uplands LCA lies adjacent to LCA19 – Loughcrew and Slieve na Calliagh Hills. This LCA is considered to be of 'Exceptional' Landscape value and of National/ International importance due to the Loughcrew Passage Tombs dating from around 3000 BC. Murren's Quarry lies some 6km southwest of the Loughcrew Passage Tombs.

Recommendations specific to LCA19 include:

- *Have regard to the importance of this LCA as the setting for the Loughcrew Hills (LCA 19) by conservation of the diverse rural landscape and sensitive location and design of new development.*

- *Compliment sensitive location of any new development with the preservation of the rich patchwork of historic features that demonstrate longstanding human use of this LCA.*
- *New development in the countryside should be of a low density and small scale and use vernacular materials and styles to fit with the landscape character.*

Figure 12-3: Landscape Value Ratings at Site (Meath CDP)



12.3.1.2 Westmeath County Development Plan (CDP) 2021-2027

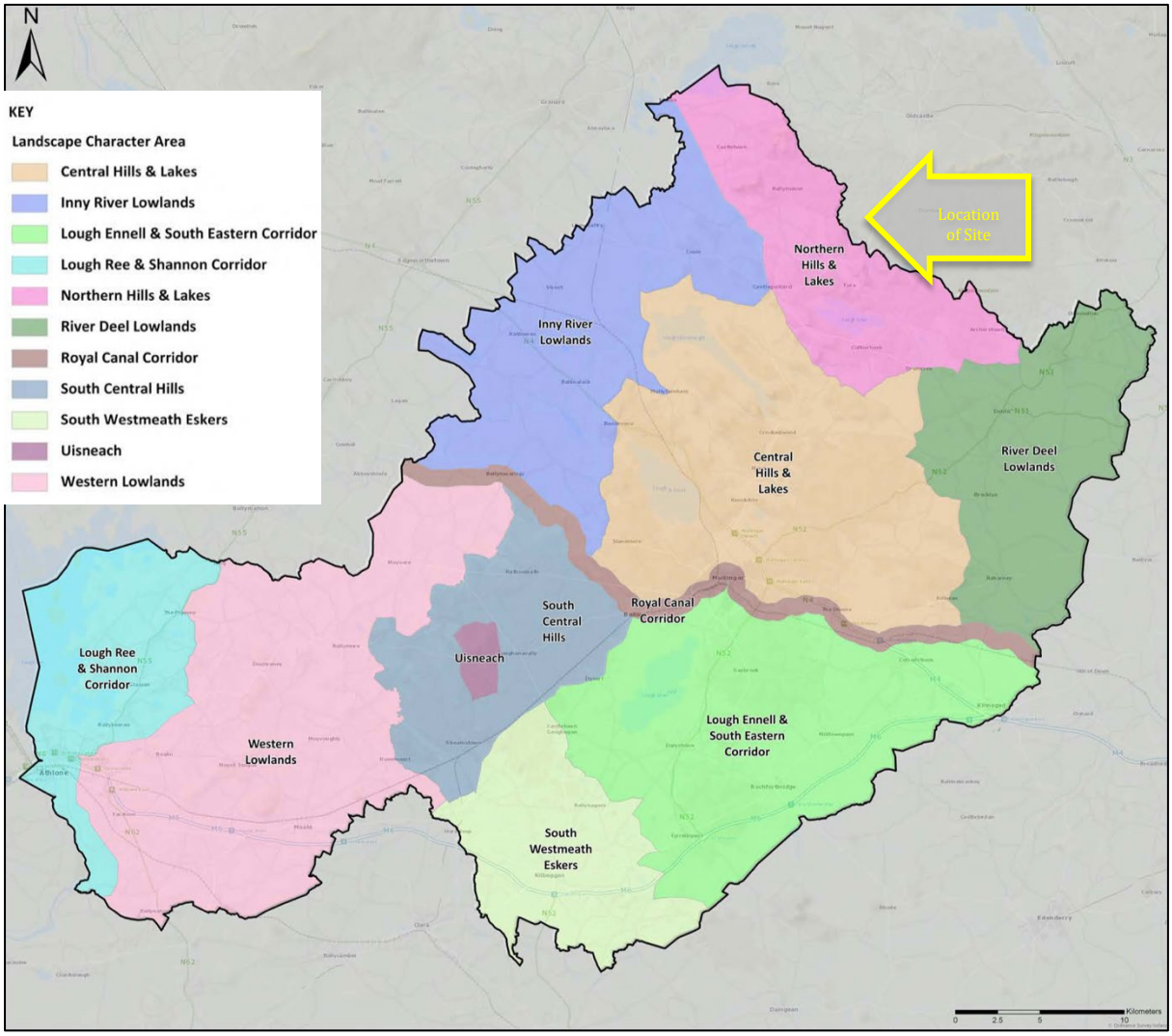
The southwestern portion of the study area falls within County Westmeath.

The Westmeath County Development Plan 2021-2027 [5] included a Landscape Character Assessment. This is described as "*a tool for identifying the features that give a specific area its 'sense of place' and also provides policy recommendations relating to each landscape type*."

The study area falls within the Northern Hills and Lakes LCA (see Figure 12-5 below). This is described as:

> *"prominent hills topped with chert or cherty limestone with enclosed lakes and areas of peat deposits, mostly fen. A rural landscape of particularly high scenic quality containing a number of lakes with several preserved views, Lough Lene Area of High Amenity and Fore Special Heritage Area"*

Figure 12-4: Landscape Character Areas at the Site (Westmeath CDP)



Some general policies regarding landscape character include [5]:

- *"Protect the distinctiveness, value and sensitivity of County Westmeath's landscapes and lakelands by recognising their capacity to sustainably integrate development";*
- *"Conserve and enhance the high nature conservation value of the Landscape Character Areas in order to create/protect ecologically resilient and varied landscapes";* and,
- *"Require that development is sensitively designed, so as to minimise its visual impact on the landscape, nature conservation, archaeology and groundwater quality."*

12.3.1.3 National Parks & Wildlife Service (NPWS)

The nearest Special Area of Conservation ('SAC') is White Lough, Ben Loughs and Lough Doo SAC, approximately 1km southwest of the Site at its nearest point. This straddles the border with County Westmeath.

Lough Naneagh Proposed Natural Heritage Area ('pNHA') is located to the west of the Site and encompasses a portion of the neighbouring quarry.

12.4 Receiving Environment

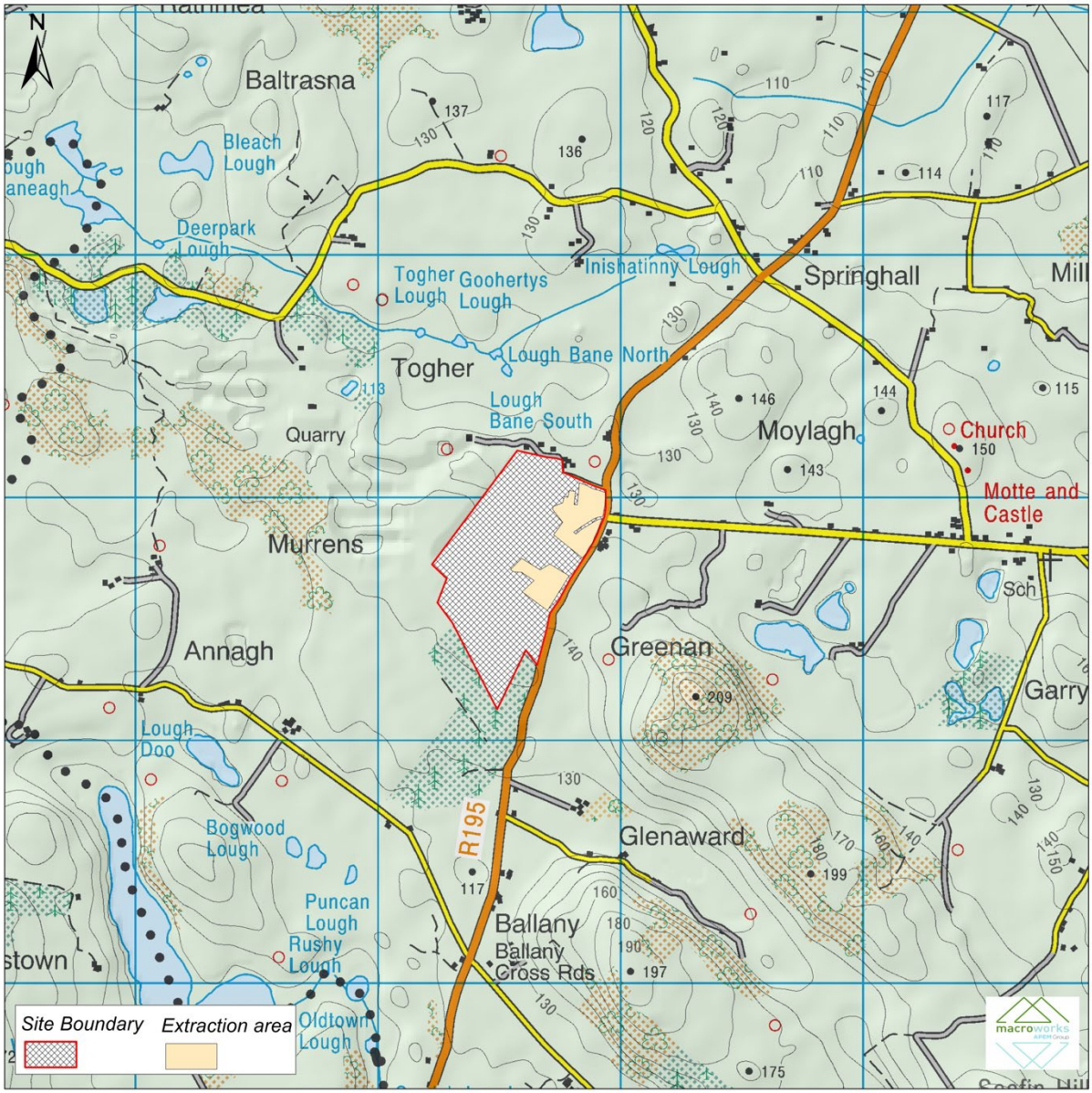
12.4.1 Landscape Baseline

The landscape baseline represents the existing landscape context and is the scenario against which any changes to the landscape brought about by the proposed development will be assessed. A description of the landscape context of the Quarry (including the 110 kV substation and grid connection), the Site and the wider study area is provided below under the headings of landform and drainage, vegetation and land use, centres of population and houses, transport routes and public amenities and facilities. Although this description forms part of the landscape baseline, many of the landscape elements identified also relate to visual receptors i.e. places and transport routes from which viewers can potentially see the Proposed Development. The visual resource will be described in greater detail in Section 12.4.2 below.

12.4.1.1 Landform and Drainage

The landform of the Site itself is heavily influenced by historic extraction activities, which have resulted in heavily modified terrain that contrasts with the surrounding hills and ridges in the immediate vicinity of the Site. The Site is primarily comprised of exposed bedrock, with the main processing area located centrally. The landform of the wider study area is relatively non-distinctive and comprises flat to low-rolling terrain interspersed with small lakes and surrounding wetland. To the south of the Site, on the border with County Westmeath, lies White Lough, the largest of a number of small lakes which populate the county border. See Figure 12-5 below.

Figure 12-5: Landscape Context of the Central Study Area



12.4.1.2 Vegetation and Land Use

The Quarry is the most intensive land use in the study area. It is surrounded by small to medium areas of forestry which screen much of the quarry activity. Aside from the quarry and surrounding forestry, the predominant land use within the study area is agriculture, with pastoral farmland predominating. Small to medium-sized fields bound by dense mixed hedgerow vegetation and mature tree lines dominate this landscape. The landscape character around settlements tends to be a well-managed patchwork of small pastoral fields with dense hedgerows, small areas of woodland, and several small lakes. Views within this area are generally limited by the combination of topography and successive bands of vegetation.

12.4.1.3 Centres of Population and Housing

The closest dwellings to the Site are located along its immediate eastern boundary, along the R195 regional road. The more notable agglomeration of rural dwellings occurs further to the east, along a local road towards the crossroads settlement of Drumone. The wider agrarian landscape contains a reasonably dispersed rural population, inhabiting crossroad settlements and linear clusters of dwellings along local roads. The nearest and most notable settlement is

that of Oldcastle, which is situated just over 5 km northeast of the Site. The other notable, but more distant settlement is Castlepollard, located approximately 7km to the southwest of the Site in County Westmeath.

12.4.1.4 Transport Routes

The only notable road within close proximity of the Site is the regional road R195, which runs north to south, connecting the town of Oldcastle to Castlepollard in Westmeath to the south. Typical of rural agrarian landscapes, the wider landscape is dissected by a network of local roads.

12.4.1.5 Tourism, Heritage and Public Amenities

There is little by way of public amenities in the immediate vicinity of the Site. The ruins of the 15th Century Moylagh Castle can be found approximately 1.5km to the east of the quarry site boundary. Mullaghmeen Forest, located some 5 km northwest of the Site and beyond the study area, is Ireland's largest planted beech forest and contains a network of waymarked trails. Beyond the study area, to the east, the Loughcrew Passage Tombs can be found, located at a distance of over 6km from the Site.

12.4.2 Visual Baseline

12.4.2.1 Viewshed Reference Points

Viewshed Reference Points (VRP's) are the locations used to study the visual impacts of a proposed development in detail. It is not warranted to include each and every location that provides a view of a development, as this would result in an unwieldy report and make it extremely difficult to draw out the key impacts arising from the proposed development. Instead, the selected viewpoints are intended to reflect a range of different receptor types, distances and angles. The visual impact of a proposed development is assessed by Macro Works using up to six. categories of receptor type as listed below:

- Key Views (from features of national or international importance) (KV);
- Designated Scenic Routes and Views (SR/SV);
- Local Community Views (LCV);
- Centres of Population (CP);
- Major Routes (MR);
- Amenity and Heritage features (AH).

VRP's might be relevant to more than one category and this makes them even more valid for inclusion in the assessment. The receptors that are intended to be represented by a particular VRP are listed at the beginning of each viewpoint appraisal.

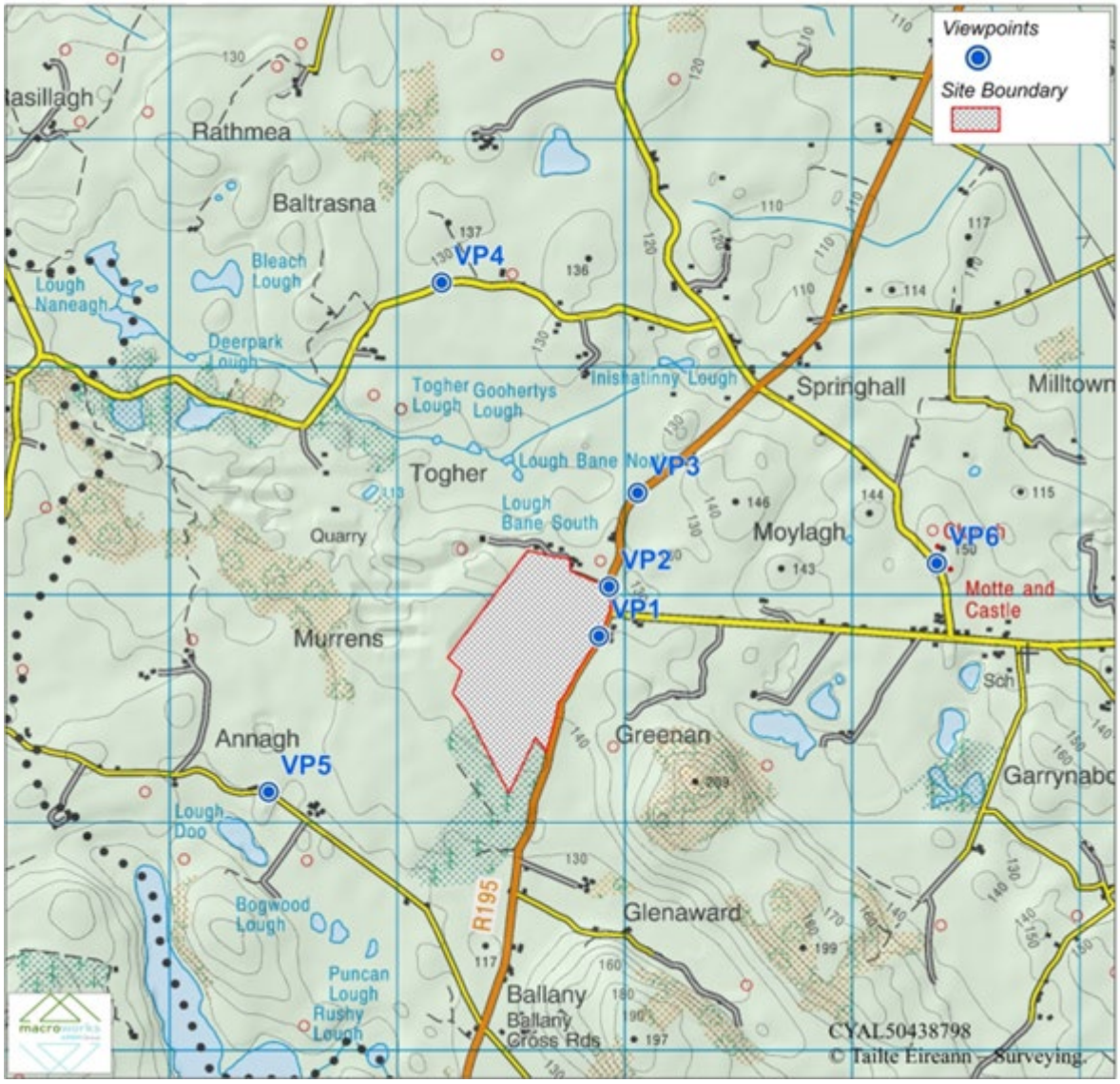
The Viewshed Reference Points selected in this instance are set out in Table 12-6 and Figure 12-6 below. The receptors that are intended to be represented by a particular VRP are shown in Table 12-6 and listed in the viewpoint appraisals in section 12.5.5 below.

Table 12-6: Outline Description of Selected VRPs

VRP No	Location	Representative of	Direction of View
VP1	Regional road R195 along eastern boundary of site	LCV	W
VP2	Junction of R195 and L68185 (quarry entrance)	LCV	S
VP3	R195, north of site	LCV	S

VRP No	Location	Representative of	Direction of View
VP4	Local road, northwest of site	LCV	SE
VP5	Local road, south of site	LCV	NE
VP6	Moylagh Castle, scenic view	SV, AH	SW

Figure 12-6: Location of VRPs



12.5 Characteristics and Potential Effects of the Proposed Development

12.5.1 Do-Nothing Scenario

The '*do-nothing'* impact refers to the non-implementation of the Proposed Development. The primary effect of this would be that the impacts and effects identified would not directly occur. In this regard the following issues are relevant - the Site, which is currently contained in unused pastoral farmland, would likely continue as such whilst the surrounding perimeter vegetation would continue to grow out, some of which would be maintained by the current landowners.

12.5.2 Assessment of Receptor Sensitivity - Landscape

Landscape value and sensitivity are considered in relation to a number of factors highlighted in the GLVIA3, which are set out below and discussed relative to the Site and the wider study area.

The Site and its immediate vicinity are predominately characterised by the existing extractive land use. Indeed, much of the landform within the Site is comprised of large areas of extracted materials and spoil. There are some localised areas of vegetation, however, for the most part this is a highly modified landscape context shaped by years of extraction. The existing machinery within the Site also generates a strong anthropogenic character, whilst the tones and textures of the extracted materials contrast strongly with the more typical tones and textures found throughout the neighbouring pastoral landscape. To the north and east, the more typical pastoral landscape remains, whilst to the west lies another large quarry. To the south extensive blocks of commercial conifer forestry can be found.

The wider study area, where the Proposed Development represented a smaller and less influential feature of the overall landscape fabric, is characterised by a much-modified, intensively managed pasture in mostly small fields across low, rolling countryside. Elsewhere there are sections of commercial conifer plantations, human settlement and some relatively small loughs. There was some degree of a pleasant pastoral aesthetic within this landscape, likely enjoyed by locals and passers-by.

Regarding the degree of perceived naturalness within the wider landscape, the nearest SAC is White Lough, Ben Loughs and Lough Doo SAC, approximately 1km southwest of the Site at its nearest point. In addition to this, the Lough Naneagh pNHA is located to the west of the Site and encompasses a portion of the neighbouring quarry.

On balance, the landscape sensitivity of the Site itself is considered **Low** due to its heavily modified nature. The wider study area, which presents with more typical rural qualities, is deemed to be **Medium-low** with some localised areas of higher sensitivity.

12.5.3 Assessment of Receptor Sensitivity – Visual

The sensitivity of visual receptors does not range widely across the study area and particularly that part of it that affords views of the Site, as they are generally contained within the same landscape context. Views tend to be across a pleasant rural landscape setting of rolling fields, or from nearby settlement/residential receptors. There are some surrounding loughs that will present with a more notable sense of scenic amenity, albeit at a localised scale.

Views of the working agricultural landscape are generally pleasant in terms of its rolling pastoral aesthetic and 'green', settled working character. The network of hedgerows and vegetation throughout contributes to some sense of naturalness. However, the surrounding local and wider landscape is also influenced by an array of anthropogenic features such as major transport routes, urban settlements, and industrial development. There is one designated scenic view within the study area, located to the east of the Site, which relates to the ruins of Moylagh Castle and is represented by VP6. Overall, the sensitivity of visual receptors within the more typical working landscape tends to range between Medium and Medium-low, with those of a Medium sensitivity representing more open expansive views across the wider landscape.

Key differentials in terms of visual receptor sensitivity relate to the occupation of the visual receptor and whether views of the surrounding landscape are an inherent part of the experience. Static residential receptors are considered generally more susceptible to changes in views over those where views are experienced transiently by those travelling through the landscape, particularly on major transport routes where road infrastructure and traffic volume draw from visual amenity. Likewise, receptors located in closer proximity to the Site are

considered more susceptible to changes in views over those where views are experienced at a distance.

On the basis of the site-specific factors outlined above and in accordance with the general visual receptor sensitivity considerations (see Section 12.2.5.1), visual receptor sensitivity judgements are provided for each representative viewpoint in Section 12.6.5 below.

12.5.4 Magnitude of Landscape Effects – Operational Stage

In terms of physical landscape effects, the extraction phase of the Proposed Development will create two new voids within the already highly modified terrain of the Site (which comprises existing pits and notable areas of stored material). Both extraction areas are located along the north-eastern and eastern boundary of the Site.

This is a productive rural landscape that has been the site of ongoing quarrying processes since the 1960s. Therefore, it is not considered that the future extraction areas will noticeably detract from the integrity of landscape patterns or the productive landscape character that prevails in the area. Indeed, the future extraction areas are contained within the existing context of the quarry and, as such, the effects relate to an intensification of a well-established land use rather than the introduction of a new and unfamiliar form of development. There will be a small loss of existing green fields along the north-eastern corner of the Site; however, it should be noted that the proposals seek to maintain existing tree lines established within the Site, which help reduce the perceived scale and extent of the extraction area.

In terms of landscape character, the Proposed Development has limited potential to significantly alter the character of the local landscape, as the quarry already plays an influential role. While there will be a slight intensification of quarry-related development, effects on the landscape character will be highly localised to the few areas where the future extraction areas will be visible.

quarry-related activities such as the movement of heavy vehicles within, as well as to and from the Site, are already commonplace. However, there may be a slight increase in the frequency of heavy vehicle movements within the local road network, as a result of the expansion of the quarry.

On the basis of the factors discussed above, it is considered that the magnitude of landscape impact is in the order of **Medium** in the immediate vicinity of the Site (ca. <500m from site boundaries). The magnitude of the impact will soon reduce thereafter as the future extraction areas become a smaller component of the overall landscape fabric and are more likely to be read in conjunction with the existing quarry.

With reference to the significance matrix, the **Medium-low** landscape sensitivity judgement attributed to the study area coupled with a **Medium** magnitude of landscape impact is considered to result in an overall significance of no greater than **Moderate-slight** and **Permanent** within the immediate vicinity of the application site and reducing to imperceptible at greater distances.

12.5.5 Magnitude of Visual Effects – Operational Stage

The assessment of visual impacts at each of the selected viewpoints is aided by photomontages of the Proposed Development. Photomontages are a 'photo-real' depiction of the scheme within the view utilising a rendered three-dimensional model of the development, which has been geo-referenced to allow accurate placement and scale. For each viewpoint, the following images have been produced:

1. Existing view;
2. Outline view;
3. Montage view;
4. Mitigated view

12.5.5.1 VP1 – R195 along Eastern Boundary of Site

Existing view

This is a view from the Regional Road R195 along the eastern boundary of the Site. This view is representative of three dwelling houses that are located along this section of the road overlooking the Site. The northern portion of the Site is clearly visible through a break in the winter hedgerow vegetation. A low embankment rises to the rear of the hedgerow, partially obscuring the view into the lower part of the Site. Where the hedgerow is more established, the view into the Site is reduced.

Representative of:

LCV

Visual Receptor Sensitivity

The visual receptor sensitivity is deemed **Medium-Low**.

Magnitude of Visual Impact

This view, afforded from a gap in the roadside hedgerow, looks directly into the quarry facility. The upper portion of part of the future extraction area is briefly visible from this location. The full extent of the future extraction area is screened by a low berm along the Site boundary, as well as intervening mature trees which are to be retained within the Site. The retention of this vegetation aids in assimilating the Proposed Development into the view. When viewed at this distance and in the context of the Quarry site, it is unlikely that the visible portion of the future extraction area will catch the eye of the casual observer. On balance, the magnitude of visual impact is considered to be **Low-negligible**.

Once the proposed mitigation measures have been established, the future extraction area will be entirely screened by vegetation when viewed from the R195. As such, the magnitude of visual impact will reduce to **Negligible.**

Pre-Mitigation Significance / Duration / Quality of Effect

The significance of the visual effect is **Slight-Imperceptible.** The duration of effect is considered **Long-term**, while the quality of the effect is considered **Negative**.

Post-Mitigation Significance / Duration / Quality of Effect

The significance of the visual effect is **Imperceptible.** The duration of effect is considered **Long-term**, while the quality of the effect is considered **Negative**.

12.5.5.2 VP2 – Quarry entrance

Existing view

This is a view from the current quarry entrance facing south across the Site. There is a clear view of the quarry grounds and earthworks associated with extraction. Heavy machinery can be seen in the background of the image, in addition to large stockpiles of material. The field in the foreground of the image has largely been left untouched by excavation activity. Short stretches of hedgerow within the field provide some degree of screening to the existing quarrying activity beyond.

Representative of:

LCV

Visual Receptor Sensitivity

The visual receptor sensitivity is deemed **Medium-Low**.

Magnitude of Visual Impact

From this viewpoint, the future extraction areas are clearly visible, extending into the field in the foreground. A clear, unobstructed view of the future extraction areas will be visible from the adjoining road. However, the retention of existing hedgerow vegetation within the Site limits the extent to which the wider quarry area is visible. This view of the Site will predominantly be experienced by road users and will be brief in nature. It is important to note that while the visual change here is quite notable, the existing view overlooks a highly modified landscape, containing visible areas of extraction and stockpiles of material. The future extraction areas can be seen here as a localised intensification of the existing land use. On balance, the magnitude of visual impact is considered to be **High-Medium**.

Once the proposed mitigation measures have been established, the future extraction areas will be entirely screened by vegetation when viewed from the R195 and quarry entrance. As such, the magnitude of visual impact will reduce to **Low-negligible.**

Pre-Mitigation Significance / Duration / Quality of Effect

The significance of the visual effect is **Moderate.** The duration of effect is considered **Long-term**, while the quality of the effect is considered **Negative**.

Post-Mitigation Significance / Duration / Quality of Effect

The significance of the visual effect is **Slight-imperceptible.** The duration of effect is considered **Long-term**, while the quality of the effect is considered **Negative**.

12.5.5.3 VP3 –R195, north of site

Existing view

This is a view along the R195, some 400m from the northern extent of the Site. The view is representative of the surrounding local community receptors. The view to the south captures the undulating terrain of the surrounding area and is contained at a short distance by a low ridge within an agricultural field. The canopy of several mature trees along the northern extent of the Site are visible above the ridgeline.

Representative of:

LCV

Visual Receptor Sensitivity

The visual receptor sensitivity is deemed **Medium-Low**.

Magnitude of Visual Impact

The Proposed Development will not be visible from here due to screening afforded by intervening terrain/ vegetation and is deemed **Negligible / Neutral** by default.

Significance / Duration / Quality of Effect

The significance of the visual effect is **Imperceptible.** The duration of effect is considered **Long-term**, while the quality of the effect is considered **Neutral**.

12.5.5.4 VP4 – Local road Northwest of Site

Existing view

This is a view along a local road to the northwest of the Site. The view is representative of the surrounding local community receptors, with a number of individual residential dwellings located along this stretch of road. The view is contained at a medium distance by intervening layers of mature hedgerow and small pockets of forestry. The Quarry facility is not visible. Otherwise, a pleasant view is afforded here of the distant hills.

Representative of:

LCV

Visual Receptor Sensitivity

The visual receptor sensitivity is deemed **Medium**.

Magnitude of Visual Impact

The Proposed Development will not be visible from here due to screening afforded by intervening terrain/ vegetation and is deemed **Negligible / Neutral** by default.

Significance / Duration / Quality of Effect

The significance of the visual effect is **Imperceptible.** The duration of effect is considered **Long-term**, while the quality of the effect is considered **Neutral**.

12.5.5.5 VP5 – Local road South of site

Existing view

This is a view along a local road to the south of the Site. The view is representative of the surrounding local community receptors, with a number of individual residential dwellings located along this stretch of road. The view from the road is contained by intervening layers of mature hedgerow and small pockets of forestry. The quarry facility is not visible from here.

Representative of:

LCV

Visual Receptor Sensitivity

The visual receptor sensitivity is deemed **Medium**.

Magnitude of Visual Impact

The Proposed Development will not be visible from here due to screening afforded by intervening terrain/ vegetation and is deemed **Negligible / Neutral** by default.

Significance / Duration / Quality of Effect

The significance of the visual effect is **Imperceptible.** The duration of effect is considered **Long-term**, while the quality of the effect is considered **Neutral**.

12.5.5.6 VP6 – Moylagh Castle, scenic view from local road

Existing view

This is a scenic view identified in the current Meath CDP [4], taken from the local road at the base of Moylagh Castle, approximately 1.45km from the Proposed Development at its nearest point. The view is situated on a relatively elevated position and offers a clear view towards the southwest. The view is representative of the amenity and heritage feature of Moylagh Castle, as well as surrounding local community receptors, with a number of individual residential dwellings located along this stretch of road. The view from the road is largely contained at a medium distance by intervening layers of mature hedgerow and small pockets of trees. The quarry facility is not visible from here.

Representative of:

SV, AH

Visual Receptor Sensitivity

The visual receptor sensitivity is deemed **High-medium**.

Magnitude of Visual Impact

The Proposed Development will not be visible from here due to screening afforded by intervening terrain/ vegetation and is deemed **Negligible / Neutral** by default.

Significance / Duration / Quality of Effect

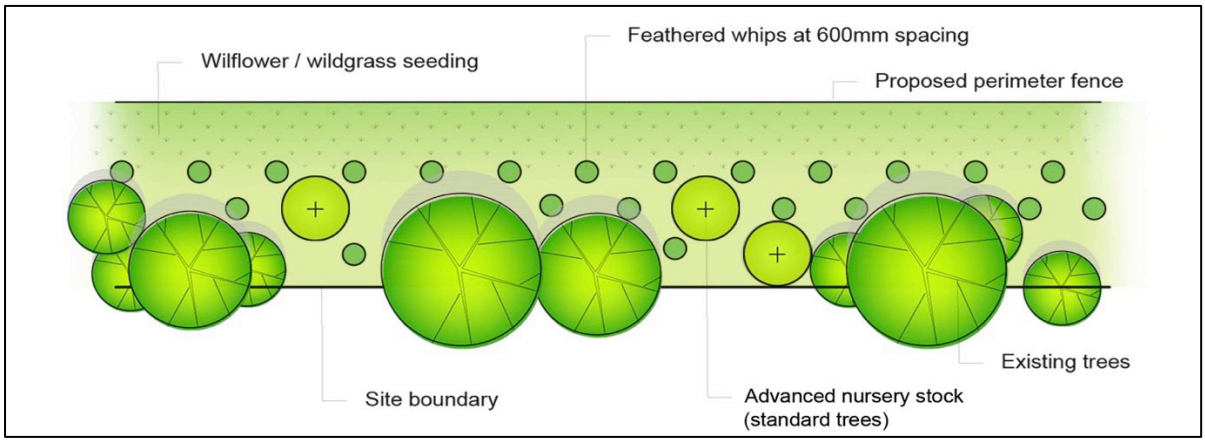
The significance of the visual effect is **Imperceptible.** The duration of effect is considered **Long-term**, while the quality of the effect is considered **Neutral**.

12.6 Proposed Mitigation Measures and/or Other Factors

The main mitigation measure employed is the siting of the Proposed Development within and adjacent to an existing quarry. Furthermore, this is a heavily contained landscape context that avails of a high degree of existing mature screening.

In addition to retaining the existing hedgerows within and around the Site, it is also proposed to bolster existing perimeter hedgerows where required along the eastern boundary of the Site with under-planting and inter-planting of whip transplants (i.e. Hedgerow Type 1 – see Figure 12-7 below) in order to ensure dense and consistent screening of the Site in perpetuity. This will be undertaken where required to thicken and fill gaps in the existing hedgerow network.

Figure 12-7: Hedgerow Type 1



It is also proposed to plant new 'Type 2' hedgerows (see Figure 12-8 below) with native whips along the north-eastern boundaries of the Site and alongside the R195 and the quarry access road, totalling some ca. 125m. This will further screen the Proposed Development from some of the nearest surrounding receptors. This planting will be allowed to mature up to a maintained height of 3-4m to aid in the screening and softening of the Proposed Development from nearby dwellings and surrounding local and regional roads.

Figure 12-8: Hedgerow Type 2

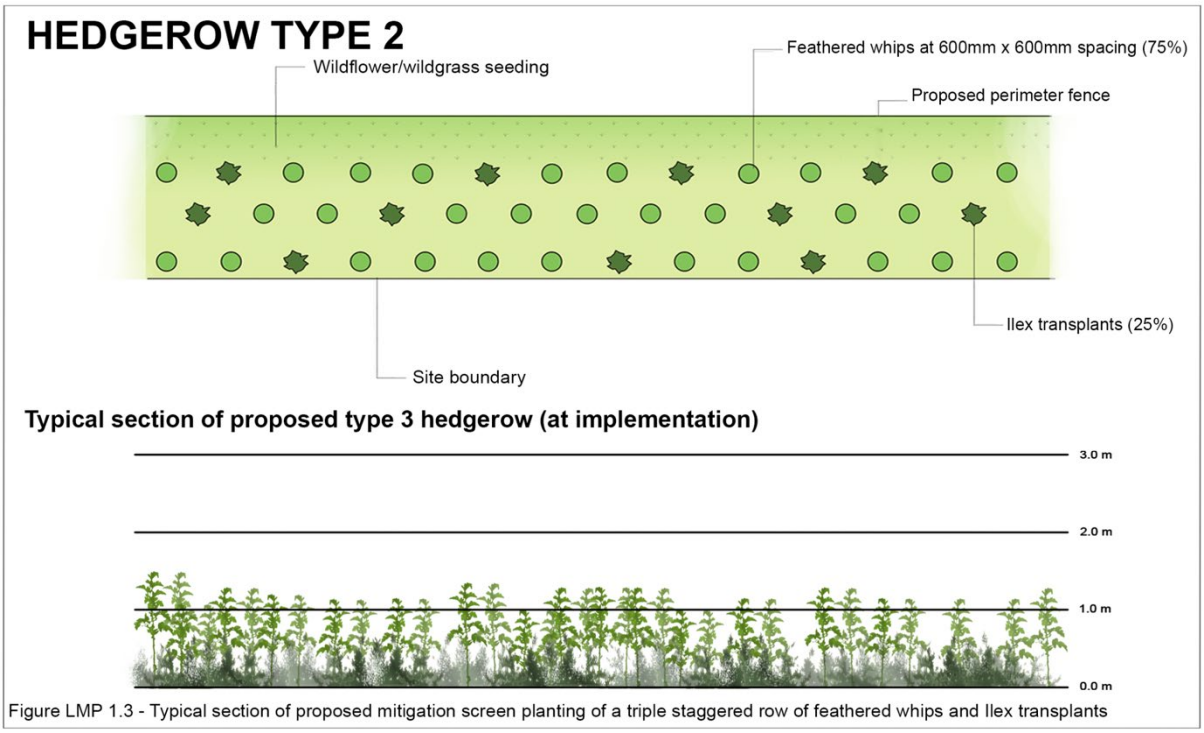


Figure LMP 1.3 - Typical section of proposed mitigation screen planting of a triple staggered row of feathered whips and Ilex transplants

The native hedgerow species mix to be included in Type 1 and Type 2 planting is specified in Table 12-7 below.

Table 12-7: Native Hedgerow Species for Hedgerow Type 1 and Type 2

Botanical Name	Common Name	Size	%
Primary Structure			
Crataegus monogyna	Hawthorn	90 - 120 cm / 8 - 10 cm girth 3m br standard trees	60%
Secondary Structure			
Prunus spinsosa	Blackthorn	90 - 120 cm	15%
Ilex aquifolium	Holly	90 - 120 cm	15%
Shrub Species Structure			
Viburnum opulus	Guelder Rose	60 – 90 cm	2.5%
Ligustrum vulgare	Native Privet	60 – 90 cm	2.5%
Sambucus nigra	Elder	60 – 90 cm	2.5%
Lonicera periclymenum	Native Honeysuckle	60 – 90 cm	2.5%

12.7 Cumulative and In-Combination Effects

Cumulative landscape effects can be defined [1] as those which:

> *"…result from additional changes to the landscape or visual amenity caused by the proposed development in conjunction with other developments (associated with or*

separate to it) or actions that occurred in the past, present or are likely to occur in the foreseeable future."

The principal cumulative effect relates to a large quarry facility to the northwest of the Site. In this regard, as the neighbouring quarry is existing, much of the preceding assessment accounts for the potential cumulative effects generated by the Proposed Development. The neighbouring quarry is of a larger scale to the quarry being assessed. In terms of landscape impacts, the cumulative landscape effect is notable as the quarries present as the single most prominent land use within this local landscape context. The proposed extension will result in a further intensification of quarrying activity in the area. However, the overall scale and extent of the two quarries is not as apparent in terms of the cumulative visual effect. In fact, there are very limited opportunities to afford any combined visibility of the two developments.

On balance of the above, it is considered that the extraction phase of the Proposed Development will contribute to a degree of cumulative landscape effect in relation to the neighbouring quarry to the northwest. However, this is accounted for in the landscape effects already stated above. In terms of the cumulative visual effects, there is very limited opportunity to afford any combined views of the Proposed Development and the neighbouring existing quarry. Overall, the cumulative effect of the Proposed Development is deemed not significant, especially considering it is the smaller of the two existing quarry developments.

12.8 Interactions with Other Environmental Attributes

The other environmental factors with which landscape and visual effects interact with are:

Chapter 5 – Population and Human Health: The population's enjoyment of the local landscape, and the resultant benefits to health, can be affected by unsuitable visual effects arising from a development. The visual effect of the Proposed Development and the effect on the landscape have been assessed in this chapter, with the conclusion that - after mitigation measures – the landscape and visual effects of the Proposed Development will not exceed 'moderate', even in the immediate vicinity. The effect on the local population and human health will therefore be not likely and not significant.

Chapter 6 – Biodiversity: Biodiversity can be impacted upon or enhanced where vegetation structures serve as both a biodiversity and visual screening function. The restoration plan to be implemented as part of the Proposed Development will have a positive effect on the landscape. Additionally, the Proposed Development will not remove existing hedgerows and hedgerows to be planted will act as a visual screen. Hence the effect on biodiversity from landscape and visual inputs will be positive.

Chapter 13 – Cultural Heritage: There is a possible correlation between the effect of the Proposed Development on the landscape/visual and its effect on cultural heritage, particularly in terms of physical effects resulting from the preparation and excavation phases. However, chapter 13 concluded that after mitigation measures, there will be no overall residual effect of the Proposed Development on cultural heritage.

12.9 Indirect Effects

No indirect landscape and visual effects from the Proposed Development are likely.

12.10 Residual Effects

In terms of landscape impacts, there will be some noticeable physical impacts to landform and land cover at a site scale, but in the context of the wider setting, these will be limited and unlikely to be noticed beyond the immediate context of the Site.

Overall, it is considered that the landscape of the study area is principally that of a productive, rural landscape, with the immediate vicinity predominately characterised by the existing extractive land use. There is some degree of scenic amenity, highlighted by a designated

scenic view at Moylagh Castle some 1.5 km to the east of the Site. However, there is no particular sense of scenery or naturalness in the immediate vicinity of the Site.

On balance, the significance of landscape impact is deemed to be Moderate-slight within the immediate vicinity of the Site and reducing to Slight and Imperceptible at increasing distances.

Visual impacts were assessed at six viewpoints which represent different receptors, viewing distances and viewing angles within the study area. Visibility of the Proposed Development is limited to the first two viewpoints, with both of these views located along the immediate boundary of the Site. From VP1, a glimpsed view from a break in the roadside vegetation of the regional road R195, the future extraction areas are considered to have a Slight-imperceptible significance of visual effect and are unlikely to detract notably from this already heavily modified viewing context. Once the proposed mitigation measures have been established, the significance of visual effect will reduce further to Imperceptible.

From VP2, which affords the clearest view of the Site, the significance of visual effect pre-mitigation is deemed to be Moderate. While the visual change here is quite notable, the existing view overlooks a highly modified landscape, containing visible areas of extraction and stockpiles of material. The future extraction areas can be seen as a localised intensification of the existing land use. However, once the proposed new hedgerow along this portion of the Site boundary is established, the future extraction areas will no longer be visible from the road and the significance of effect will reduce to Slight-imperceptible.

The Proposed Development was not visible from the remaining four viewpoints and as such the significance of effect at these locations was imperceptible by default. Overall, the residual visual effect of the Proposed Development is highly localised to a short section of the R195 regional road located to the northeast of the Site, which is already influenced by views of extracted land. There will be a minor intensification of quarry-related development. However, the residual visual effects are deemed not significant.

12.10.1 Overall Significance of Effect

Based on the landscape and visual impact judgements provided throughout this LVIA, the Proposed Development is not considered to give rise to any significant residual effects.

Landscape effects are not considered to exceed 'Moderate-slight' significance, even in the immediate context of the Site.

Residual visual effects are not considered to exceed 'Moderate-slight' significance, reducing to 'Slight-imperceptible' once the proposed mitigation has been established. In the context of this quarry development, these moderate to low-level residual effects are deemed not significant.

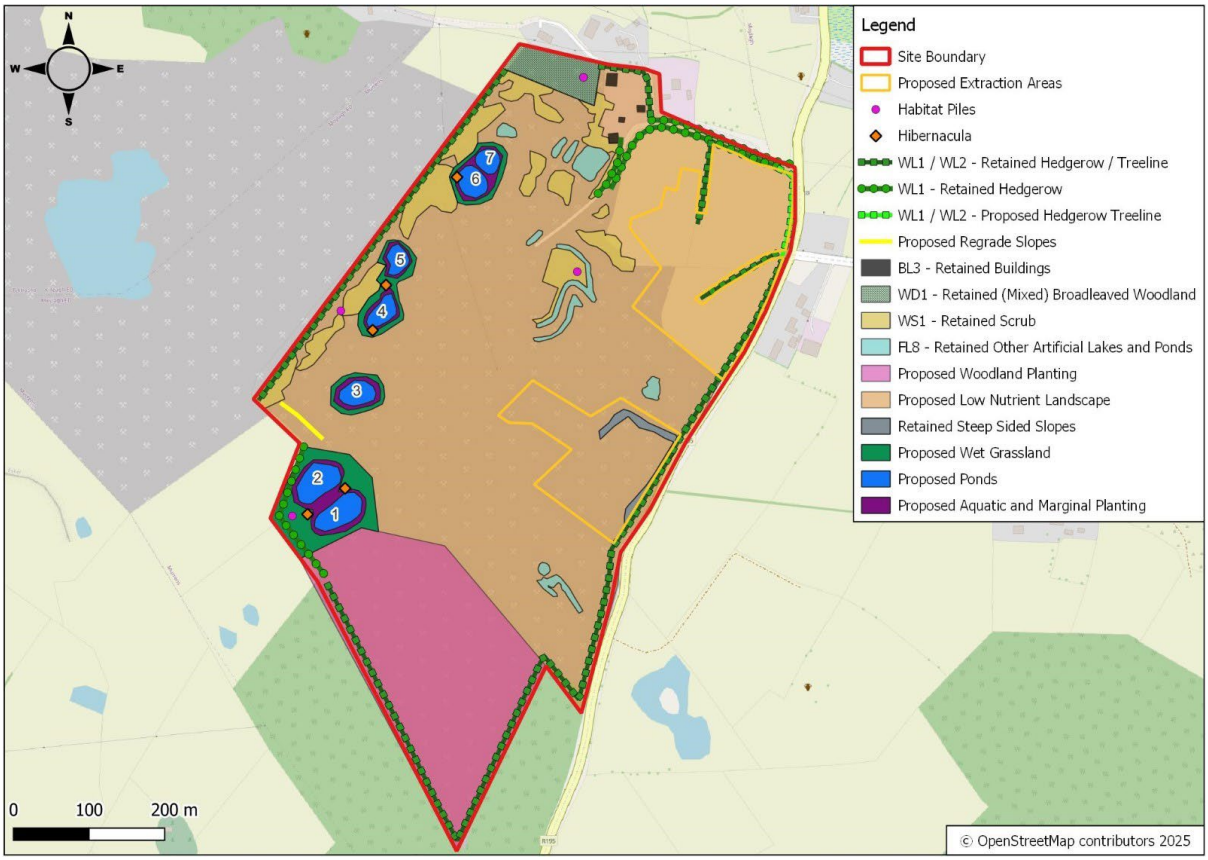
12.11 Monitoring

No monitoring measures are deemed necessary.

12.12 Reinstatement

The proposed reinstatement measures are included in Figure 12-9. The majority of the Site is to be reinstated as a low nutrient landscape with woodland planting located along the southern boundary of the Site. Localised areas of aquatic and marginal planted and proposed ponds are also to be situated along the southern boundary of the Site, whilst hedgerows and treelines along the perimeter will also be retained. It should also be noted that any stockpiles of material stored on-site will also be used for restoration purposes. Overall, once fully restored, the Proposed Development will generate some localised positive effects and enhanced the sites and surrounding landscape ecological values.

Figure 12-9: Proposed Reinstatement Measures



12.13 Difficulties Encountered in Compiling this Information

No difficulties were encountered.

12.14 References

[1] Landscape Institue and IEMA, "Guidelines for Landscape and Visual Impact Assessment (GLVIA 3)," 2013.

[2] EPA, "Guidelines on the Information to be Contained in Environmental Impact Assessment Reports," Environmental Protection Agency, Dublin, 2022.

[3] EPA, "Advice Notes on Current Practice (in the preparation of Environmental Impact Statements)," EPA, 2003.

[4] Meath County Council (MCC), "Meath County Development Plan 2021-2027," Meath County Council (MCC), 2021-2027.

[5] Westmeath County Council, "County Development Plan 2021-2027," WCC, Mullingar, 2021.

FIGURES

TABLES

13 CULTURAL HERITAGE

13.1 Introduction

This Chapter of the EIAR, commissioned by MOR Environmental on behalf of the Applicant, addresses the effects on the archaeological, architectural and cultural heritage of the Site, and the surrounding area, of a proposal to continue and extend quarrying at Murrens Quarry, County Meath.

13.2 Methodology

This study complies with the requirements of Directive EIA 2014/52/EU. The chapter is an assessment of the known or potential cultural heritage resource within a specified area and includes the information that may reasonably be required for reaching a reasoned conclusion on the significant effects of the project on the environment, taking into account current knowledge and methods of assessment. It consists of a collation of existing written and graphic information in order to identify the likely context, character, significance and sensitivity of the known or potential cultural heritage, including architectural and archaeological aspects, using appropriate methodology as set out by the Environmental Protection Agency [1] [2].

The report was prepared by Dr Charles Mount (MA, PhD, MBA, Dip. EIA & SEA Mgmt. MIAI).

The report format and some of the descriptions of effects are based on the Guidelines on the Information to be contained in Environmental Impact Assessment Report, published by the Environmental Protection Agency (EPA) in 2022 [2] (see Table 13-1 below).

Table 13-1: Criteria and Definitions of Effects

Term	Quality of Effect	Description
Quality of Effects	Positive	A change which improves the quality of the environment.
	Neutral	No effects or effects that are imperceptible, within normal bounds or variation or within the margin of forecasting error.
	Negative/Adverse	A change which reduces the quality of the environment.
Significance of effects	Imperceptible	An effect capable of measurement but without noticeable consequences.
	Not Significant	An effect which causes noticeable changes in the character of the environment but without noticeable consequences.
	Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
	Moderate	An effect that alters the character of the environment in a manner that is consistent with existing & emerging trends.
	Significant	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
	Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters the majority of a sensitive aspect of the environment.
	Profound	An effect which obliterates sensitive characteristics
Extent & context of effects	Extent	Size of an area, number of sites & population proportion affected by an effect.
	Context	Describes whether the extent, duration, or frequency will conform or contrast with established (baseline) conditions.
Probability of effects	Likely	The effects can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.
	Unlikely	The effects can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.
Duration and Frequency	Momentary	Effects lasting from seconds to minutes.
	Brief	Effects lasting less than a day.
	Temporary	Effects lasting less than a year.
	Short-term	Effects lasting one to seven years.

Term	Quality of Effect	Description
	Medium-term	Effects lasting seven to fifteen years.
	Long-term	Effects lasting fifteen to sixty years.
	Permanent	Effects lasting over sixty years.
	Reversible	Effects that can be undone, for example through remediation or restoration.
	Frequency	How often the effect will occur: once, rarely, occasionally, frequently, constantly, - or hourly, daily, weekly, monthly, annuallu
Types of Effects	Indirect (aka secondary or off-site effects)	Impacts on the environment which are not a direct result of the project.
	Cumulative	The addition of minor or significant effects, including effects of other projects, to create a larger more significant effect.
	'Do Nothing'	The environment as it would be in the future should the project not be carried out.
	'Worst case'	The effects arising from a project where mitigation measures substantially fail.
	Indeterminable	When the full consequences of a change in the environment cannot be described.
	Irreversible	When the character distinctiveness, diversity or reproductive capacity of an environment is permanently lost.
	Residual	Degree of environmental change occurring after mitigation measures take effect.
	Synergistic	Where the resultant effect is of greater significance than the sum of its constituents.

An impact assessment and mitigation strategy have been prepared. An impact assessment is undertaken to outline potential adverse effects that the proposed development may have on the cultural resource, while a mitigation strategy is designed to avoid, reduce or offset such adverse effects.

The assessment consists of the following study stages:

- Baseline Studies; and,
- Assessment of the Proposed Development area.

13.2.1 Baseline Study

The baseline study research has been undertaken in two phases, the paper study phase and subsequently the field assessment phase.

13.2.1.1 Paper Study

The first phase comprised a paper survey of all available archaeological, historical and cartographic sources. This involved the following:

- A collation of existing written and graphical information to identify the likely context, character, significance and sensitivity of the known or potential cultural heritage,
-
- archaeological and structural resource using appropriate methodology;
- A detailed investigation of the archaeological and historical background of the Site, the landholding and the surrounding area extending 1km from the development boundary (Fig. 13-1 below). This area was examined using information from the:
    - Record of Monuments and Places ('RMP') of County Meath;
    - The Sites and Monuments Record;
    - The Meath County Development Plan 2021-27 [3] including the Record of Protected Structures;
    - The National Inventory of Architectural Heritage;

- Aerial photographs – these record cropmarks, soil marks and earthworks that may have not been previously detected;
- Excavation reports;
- Cartographic sources including seventeenth century mapping and 1st and 2nd editions of the Ordnance Survey six-inch maps; and
- Documentary sources (these provide more general historical and archaeological background).

The National Inventory of Architectural Heritage ('NIAH') is a state initiative under the administration of the Department of Culture, Heritage and the Gaeltacht and established on a statutory basis under the provisions of the Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act 1999. The purpose of the NIAH is to identify, record, and evaluate the post-1700 architectural heritage of Ireland, uniformly and consistently as an aid in the protection and conservation of the built heritage. NIAH surveys provide the basis for the recommendations of the Minister for Culture, Heritage and the Gaeltacht to the planning authorities for the inclusion of structures in their Record of Protected Structures ('RPS').

The Record of Monuments and Places was established under section 12 (1) of the National Monuments (Amendment) Act, 1994 and provides that the Minister shall establish and maintain a record of monuments and places where the Minister believes there are monuments, such record to be comprised of a list of monuments and relevant places and a map or maps showing each monument and relevant place in respect of each county in the State. The associated files contain information of documentary sources and field inspections where these have taken place. Note, although the Historic and Archaeological Heritage and Miscellaneous Provisions Act 2023 was signed into law by the President on October 13, 2023, the part of the act superseding the Record of Monuments with the Register of Monuments had not been commenced at the time this assessment was prepared. This assessment uses the Record of Monuments and Places, which were still in force when the assessment was completed.

The Sites and Monuments Record is maintained by the Department of Housing, Local Government and Heritage. It contains information on Recorded Monuments and additional unprotected sites that have been identified since the Record of Monuments was issued.

13.2.1.2 Field Assessment

The second phase involved two elements:

- A field inspection of the Site, carried out on the 6th February 2025, to identify and assess any known archaeological sites and previously unrecorded features and portable finds within the Site; and,
- A magnetic gradiometry survey of the Site, conducted by Jo Leigh in January 2025 (NMS Licence No. 25R0022).

13.3 Planning Context

13.3.1 Meath County Development Plan 2021-27

The Meath County Development Plan 2021-27 [3] is the statutory plan detailing the local authority's development objectives/policies. The plan has several policies and objectives relevant to this assessment.

Those policies and objectives relating to archaeological and architectural heritage which are of potential relevance to the Proposed Development are:

- **HER POL 1** To protect sites, monuments, places, areas or objects of the following categories:

  - Sites and monuments included in the Sites and Monuments Record as maintained by the National Monuments Service of the Department of Housing, Local Government and Heritage;
  - Monuments and places included in the Record of Monuments and Places as established under the National Monuments Acts;
  - Historic monuments and archaeological areas included in the Register of Historic Monuments as established under the National Monuments Acts; Meath County Development Plan 2021-2027 Chapter 8;
  - National monuments subject to Preservation Orders under the National Monuments Acts and national monuments which are in the ownership or guardianship of the Minister for Housing, Local Government and Heritage, or a local authority;
  - Archaeological objects within the meaning of the National Monuments Acts; and Wrecks protected under the National Monuments Acts or otherwise included in the Shipwreck Inventory maintained by the National Monuments Service of the Department of Culture, Heritage and the Gaeltacht.
- **HER POL 2** To protect all sites and features of archaeological interest discovered subsequent to the publication of the Record of Monument and Places, in situ (or at a minimum preservation by record) having regard to the advice and recommendations of the National Monuments Service of the Department of Culture, Heritage and the Gaeltacht and The Framework and Principles for the Protection of the Archaeological Heritage (1999).
- **HER POL 3** To require, as part of the development management process, archaeological impact assessments, geophysical survey, test excavations or monitoring as appropriate, for development in the vicinity of monuments or in areas of archaeological potential. Where there are upstanding remains, a visual impact assessment may be required.
- **HER POL 4** To require, as part of the development management process, archaeological impact assessments, geophysical survey, test excavations or monitoring as appropriate, where development proposals involve ground clearance of more than half a hectare or for linear developments over one kilometer in length; or developments in proximity to areas with a density of known archaeological monuments and history of discovery as identified by a suitably qualified archaeologist.
- **HER POL 5** To seek guidance from the National Museum of Ireland where an unrecorded archaeological object is discovered, or the National Monuments Service in the case of an unrecorded archaeological site.
- **HER POL 12** To recognise and respect potential World Heritage Sites in Meath on the UNESCO Tentative List – Ireland.
- **HER OBJ 1** To implement in partnership with the County Meath Heritage Forum, relevant stakeholders and the community the County Meath Heritage Plan and any revisions thereof.
- **HER OBJ 2** To ensure that development in the vicinity of a Recorded Monument or Zone of Archaeological Potential is sited and designed sensitively with a view to minimal detraction from the monument or its setting.
- **HER OBJ 3** To protect important archaeological landscapes from inappropriate development.
- **HER OBJ 4** To encourage the management and maintenance of the County's archaeological heritage, including historic burial grounds 2, in accordance with best conservation practice that considers the impact of climate change.
- **HER OBJ 5** To promote awareness of, and encourage the provision of access to, the archaeological resources of the county.

- **HER OBJ 6** To work in partnership with key stakeholders to promote County Meath as a centre for cultural heritage education and learning through activities such as community excavation and field/summer schools.
- **HER OBJ 14** To retain the surviving medieval street pattern, building lines and burgage plot widths in historic walled towns.

In relation to Architectural, Industrial and Landscape Design Heritage the Council's policies and objectives are:

- **HER POL 14** To protect and conserve the architectural heritage of the County and seek to prevent the demolition or inappropriate alteration of Protected Structures.
- **HER POL 15** To encourage the conservation of Protected Structures, and where appropriate, the adaptive reuse of existing buildings and sites in a manner compatible with their character and significance. In certain cases, land use zoning restrictions may be relaxed in order to secure the conservation of the protected structure.
- **HER POL 16** To protect the setting of Protected Structures and to refuse permission for development within the curtilage or adjacent to a protected structure which would adversely impact on the character and special interest of the structure, where appropriate.
- **HER POL 17** To require that all planning applications relating to Protected Structures contain the appropriate accompanying documentation in accordance with the Architectural Heritage Protection Guidelines for Planning Authorities (2011) or any variation thereof, to enable the proper assessment of the proposed works.
- **HER POL 18** To require that in the event of permission being granted for development within the curtilage of a protected structure, any works necessary for the survival of the structure and its re-use should be prioritised in the first phase of development. It is the objective of the Council:
- **HER POL 19** To protect the character of Architectural Conservation Areas in Meath.
- **HER POL 20** To require that all development proposals within or contiguous to an ACA be sympathetic to the character of the area, that the design is appropriate in terms of height, scale, plot density, layout, materials and finishes and are appropriately sited and designed with regard to the advice given in the Statements of Character for each area, where available.
- **HER POL 21** To encourage the retention, sympathetic maintenance and sustainable re-use of historic buildings, including vernacular dwellings or farm buildings and the retention of historic streetscape character, fabric, detail and features.
- **HER POL 24** To encourage appropriate change of use and reuse of industrial heritage structures provided such a change does not seriously impact on the intrinsic character of the structure and that all works are carried out in accordance with best conservation practice, subject to compliance with normal planning criteria.
- **HER POL 26** To encourage the protection and enhancement of heritage gardens and demesne landscapes, and to support, in consultation with the owners, the provision of public access to these sites as appropriate.
- **HER OBJ 15** To review and update the Record of Protected Structures on an on-going basis and to make additions and deletions as appropriate.
- **HER OBJ 18** To provide detailed guidance notes and continue to develop the Council's advisory/educational role with regard to heritage matters and to promote awareness, understanding and appreciation of the architectural heritage of the County.
- **HER OBJ 19** To commission a study over the lifetime of the Plan to assess the significance of the Mass Rocks and Holy Wells throughout County Meath.

- **HER OBJ 23** To ensure that conversions or extensions of traditional buildings or the provision of new adjoining buildings, are sensitively designed and do not detract from the character of the historic building.
- **HER OBJ 25** To carry out a survey of Land Commission dwellings over the life of the Development Plan, to acknowledge their contribution to the building stock of the County, as appropriate.
- **HER OBJ 26** To require an architectural / archaeological assessment, as appropriate, which references the Meath Industrial Heritage Survey and other relevant sources, for all proposed developments on industrial heritage structures or sites.
- **HER OBJ 27** To carry out Phase 2 of the Industrial Heritage Survey which will comprise a field survey and assessment of surviving structures and sites and consider (if appropriate) proposing them for addition to the Record of Protected Structures.
- **HER OBJ 28** To discourage development that would adversely affect the character, the principal components of, or the setting of historic parks, gardens and demesnes of heritage significance.
- **HER OBJ 29** To require that proposals for development in designated landscapes and demesnes include an appraisal of the landscape, designed views and vistas, including a tree survey, where relevant, in order to inform site appropriate design proposals.

13.4 Receiving Environment

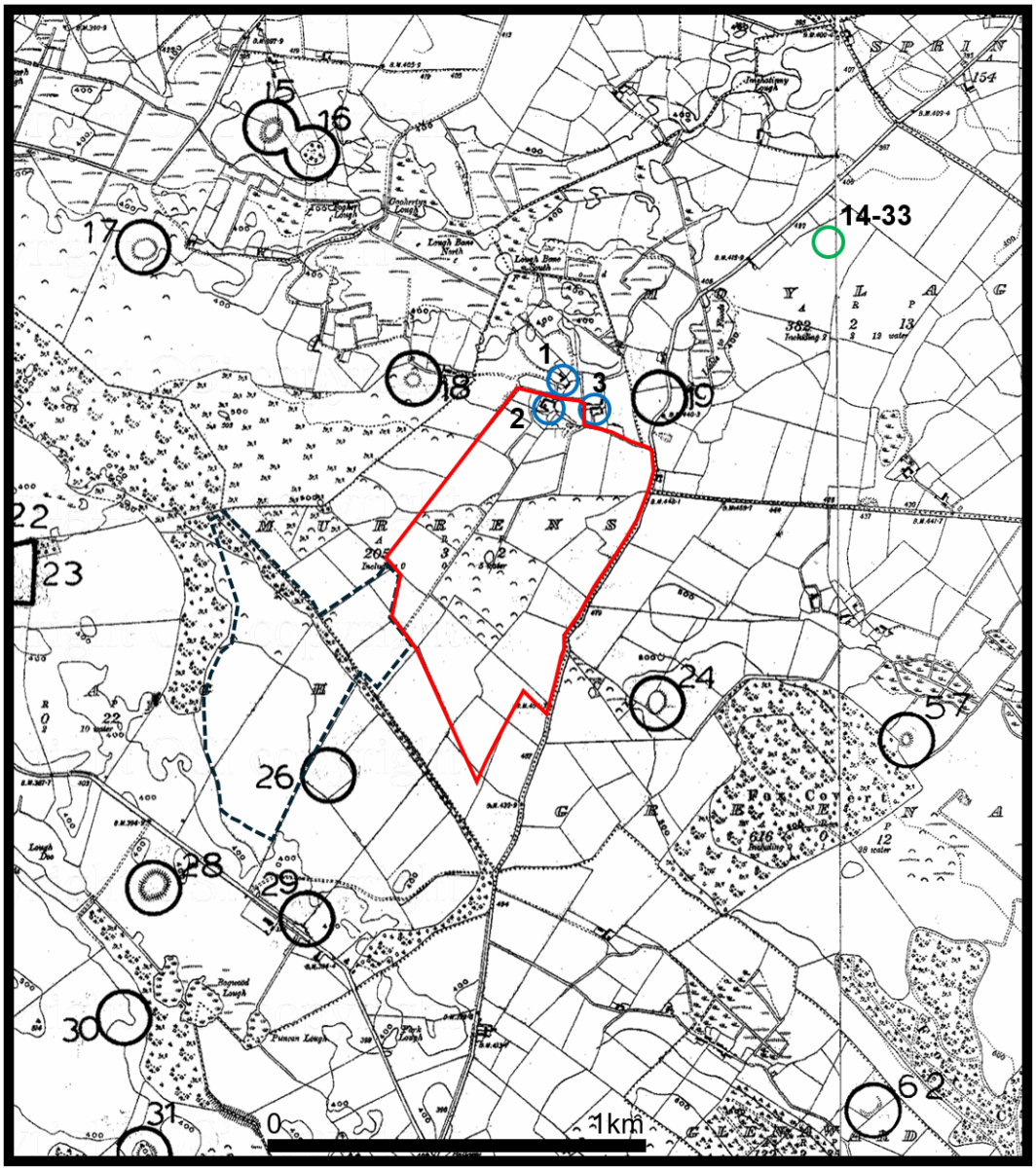
The Site is located in the townland of Murrens, Co. Meath and is located ca. 6 km to the south-west of the town of Oldcastle. It appears on OS Six Inch sheet No. 14. The soil of the area is a Rathowen series fine loamy drift with limestones with a substrate of drift with limestones.[1]

Extracts from the Record of Monuments and Places for County Meath for the local area around the Site are shown in Figure 13-1 below.

The Site is outlined in red, with RMP sites indicated with black circles and outlines and undesignated buildings in the vicinity of the Site indicated with blue circles.

[1] http://gis.teagasc.ie/soils/map,php Irish Soils Information System (accessed 14/1/2025)

Figure 13-1: Entries on the Record of Monuments and Places in the Vicinity of the Site



13.4.1 Historical and Archaeological Background

The following is a summary of the archaeological and historical development of the study area and the main types of sites, monuments and structures that are known from the surrounding area. The purpose of this approach is to place the types of sites, monuments and structures in the study area in a cultural and chronological context to assist the assessment. The Site is situated in the townland of Murrens, the civil parish of Moylagh and the barony of Fore. Note the original spellings of placenames recorded in source material are retained in the text.

13.4.1.1 The Prehistoric Period

The nature of prehistoric activity in the study area is unclear as there are no prehistoric sites or finds known from the area.

13.4.1.2 The Early Medieval Period

In the early medieval period, the barony of Fore formed part of the Kingdom of Caille Follamain which was ruled by a branch of the southern Ui Neill descended from Colman Becc who died

about AD 587. The centre of the Kingdom was at Kells and the earliest King, Tuathal mac Mael Tuile, is recorded here in AD 718. Five kings of Caille Follamain are recorded between AD 851 and 1017 [4].

Settlement in the early medieval period is indicated by enclosed farmsteads known as ringforts and the Record of Monuments and Places shows that there are a number in the study area in Baltrasna (ME014-015, ME014-016, ME014-017, ME014-018), Moylagh (ME014-019----), Annagh (ME014--022----; ME014-025---), Glenaward (ME14-062---) and Greenan (ME14-O24---) townlands (see Appendix 13-1), as well as a number of undated enclosures that indicate substantial settlement in the study area in the early medieval period.

13.4.1.3 The Medieval Period

In 1172 King Henry II granted the Kingdom of Meath to Hugh de Lacy to hold as King Murrough O Melaghlin, King of Meath, had held it [5]. In 1241 Hugh de Lacy's son died without a male heir and Meath was partitioned between his two granddaughters. The manor of Fore, containing the study area, went to de Geneville (Lord of Trim and husband of Maud de Lacy) [5]

The process of medieval sub-infeudation is normally associated with the construction of timber castles known as Motte and Baileys. These earthwork fortifications were used to house and defend the Norman lords and their retinues while they set about the process of pacifying and organizing their new fiefs. Hugh de Lacy's motte castle was situated in his Demesne manor Fore which is now in Co. Westmeath, 4km to the south of the study area.

Manorialism describes the organisation of the feudal rural economy and society, characterised by the vesting of legal and economic power in a Lord who was supported economically from his own direct landholding and from the obligatory contributions of a legally subject part of the peasant population under his jurisdiction. In Ireland, the Lord's manor house was also sometimes enclosed by a rectangular moat. These moated sites are a useful indicator of Anglo-Norman settlement. However, there are no moated sites known within the study area and there does not appear to have been any Norman settlement.

13.4.1.4 The Later Medieval Period

The fifteenth century was characterised by the decline of Anglo-Norman power in Ireland, which had been ebbing since the early fourteenth century. Part of the response to this was the construction of masonry Tower Houses which sprang up after King Henry VI introduced a building subsidy of £10 in 1429 [6]. Annagh Castle (ME014—02701-), to the south-west of the Site, is probably the remains of the Tower House that housed the lord of the study area.

13.4.1.5 The Post-medieval Period

The Down Survey and Civil Survey [7], [8] record that in 1641 Murrens (called Thomasbrydstowne) was held by Thomas Kearnan, but by 1670 was in the hands of Humphrey Rogers. Annagh was held by Walter Nugent in 1641 and by 1670 was in the hands of James Nugent. There are no structures referred to on the lands.

In the eighteenth century, Murrens passed through the hands of the Naper, Wadeet, Merryman, Wade, Nugent and Reilly families. In the early nineteenth century Murrens and Annagh were held by Walter Nugent [9].

13.4.2 Archaeological Heritage

13.4.2.1 Buildings

The Record of Protected Structures in the Meath CDP 2021-27 was reviewed as part of the baseline study for this EIAR chapter. The review established that there are no structures within the Site or the study area listed in the Record of Protected Structures.

The National Inventory of Architectural Heritage (NIAH) which is maintained by the Dept. of Housing, Local Government and Heritage was examined as part of the baseline study for this section of the EIAR on the 14 January 2025[2]. The review established that there are no structures within the Site or the study area listed in the NIAH.

On the 6th February 2025, fieldwork was carried out to identify any additional non-designated structures in the vicinity of the Site. This involved assessing all upstanding structures marked on the 1910 edition of the six-inch Ordnance Survey mapping within 100m of the Site (see Figure 13-1 above). There are three structures indicated in this area, of which two are upstanding (see Figures 13-2 and 13-3 below). None of these structures is of special architectural significance (see Table 13-2 below).

Figure 13-2: Structure One, Looking North

[2] http://webgis.archaeology.ie/historicenvironment/ Historic Environment Viewer of the Department of Housing, Local Government and Heritage. (URL accessed 14/1/2025)

Figure 13-3: Structure Two, Looking North

Table 13-2: Structures in the Vicinity of the Site

Details	Description
Structure One	
Structure type	House
Townland	Murrens
Designation	None
Data source	1910 six-inch Ordnance Survey map
Perceived Significance:	None
Quality of effect:	None
Significance of effect	None
Description	Three-bay two-storey house with hipped slate roof, single central chimney stack and porch-covered entrance. This structure has no special architectural significance.
Image	Figure 13-2
Structure Two	
Structure type	Demolished
Townland	Murrens
Designation	None
Data source	1910 six-inch Ordnance Survey map
Perceived Significance:	None
Quality of effect:	None
Significance of effect	None
Description	The structure in this location has been demolished.
Image	N/A
Structure Three	
Structure type	House
Townland	Murrens
Designation	None
Data source	1910 six-inch Ordnance Survey map
Perceived Significance:	None
Quality of effect:	None
Significance of effect	None
Description	Three-bay two-storey house with hipped slate roof, two central chimney stacks and porch-covered entrance. This structure has no special architectural significance.
Image	Figure 13-3

13.4.2.2 Recorded Monuments

Examination of the Record of Monuments and Places indicates that there are no Recorded Monuments within the Site (see Figure 13-1 above, and Appendix 13-1). The closest Recorded Monument to the Site externally is ME014-019---- a Ringfort – rath in Moylagh townland (see Figure 13-4 below).

Figure 13-4: Drone view of ME014-019---- (looking Northwest)

This is described in the RMP as:

> *"ME014-019---- Moylagh Ringfort – rath*
>
> *Situated on a local rise in an undulating landscape. This is a raised and circular grass-covered area (diam. 34m WNW-ESE; 31m NNE-SSW) defined by a scarp (at SW: Wth 3m; H 1.5m; at NE: Wth 7.5m; H 3.1m) that is incorporated into a road boundary E-SE. There is no visible fosse or entrance. It was damaged in road-widening in 1979 when much of the E half was removed."*

There is an apparent north-south aligned collapsed souterrain in the interior of the monument. The monument is situated c.111m north of the Site and is considered too far distant to be directly or indirectly affected by the Proposed Development. The views from the monument to the Site are partly screened by a hedgerow with mature trees but some views of the Site remain (see Figure 13-5 below). The effects on the setting of the monument will be mitigated by the construction of a landscaped screening berm on the northern side of the Site facing the monument.

Figure 13-5: View from Ringfort ME014-019---- (looking Northeast to Site)

The remaining Recorded Monuments in the study area are situated further from the Site and are considered too far distant to be directly or indirectly affected by the proposed development.

13.4.2.3 Sites and Monuments Record

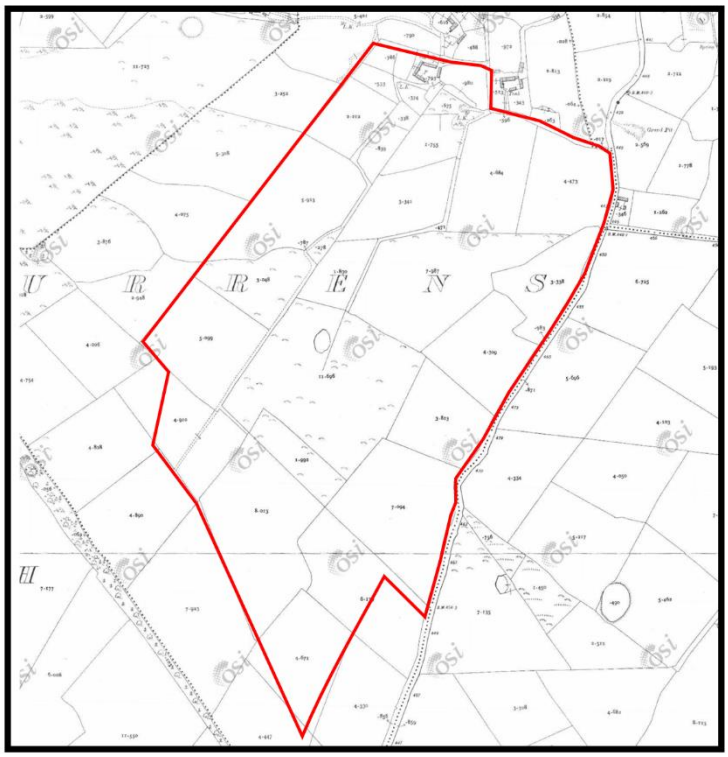
Examination of the Sites and Monuments Record ('SMR') which is maintained by the Dept. of Housing, Local Government and Heritage on 14th January 2025[3] indicated that there are no SMRs in the Site. There is one SMR in the study area (see Appendix 12.2). This is a Ringfort – rath (SMR ME014-033----) in Moylagh townland, situated c.0.7km to the northeast. This is considered to be too far distant to be directly or indirectly affected by the proposal.

13.4.3 Cartographic Sources

Ordnance Survey first and third edition six-inch maps and the first edition 25-inch maps of the area were examined. On the first edition-25-inch there are two lime kilns indicated in the northern part of the Site, and two structures, all of which have been removed (see Figure 13-6 below).

[3] http://webgis.archaeology.ie/historicenvironment/ Historic Environment Viewer of the Department of Housing, Local Government and Heritage (URL accessed 14/1/2025)

Figure 13-6: First edition of 25-inch OS Map showing Site



13.4.4 Place name evidence

Place names were extracted from the cartography in order to facilitate the search for structures and monuments and small finds, to help identify any unrecorded monuments or structures, to search for any published papers and documents related to the study area and to assist in the study of the historical development of the area. The place names were looked up in the Placenames Database of Ireland [9] - see Table 13-2 below. The placenames refer primarily to topographical features and proprietors' names.

Table 13-3: Townland Names in the Study Area

Townland name	Translation
Annagh	A marsh or morass
Baltrasna	Cross town
Ballany	Town of the marsh
Glenaward	Glen of the bard
Greenan	A sunny hill
Moylagh	A flat hill
Murrens	Beautiful hills. Thomasbridstown in 1619
Springhall	Originally Baile an tobair, town of the well

The placenames do not indicate any additional heritage sites within the study area.

13.4.5 Remote sensing

Examination of the Ordnance Survey 1995, 1996-2000, 2001-2005, 2006-12, 2011-13 and 2013-18 aerial imagery as well as Google earth imagery from 2009, 2014, 2016, 2017, 2020, 2021, 2022 and 2024 and Bing imagery from 2016 did not indicate any additional cultural heritage sites in the Site.

13.4.6 Other Sources

Examination of archaeological corpus works on prehistoric artefacts [10], [11], [12], [13], [14] and pottery [15] and Iron Age material [16] did not reveal any additional material in the study area.

13.4.7 Archaeological investigations

Examination of the Excavations Bulletin at Excavations.ie[4] indicated that there have been no licensed excavations carried out at the Site or within the study area.

13.4.8 Field Inspection

A Field inspection was carried out on 6th February 2025. This involved inspecting all the lands in the Site (see Figure 13-1 and Figure 13-5 above). The fieldwork areas are numbered in Figure 13-7 below.

Figure 13-7: Field Work Areas

13.4.8.1 Area One

This is the existing extraction area, which has been completely soil-stripped (see Figure 13-8 below). There was no visible indication of any archaeological, architectural or cultural heritage material.

4 https://excavations.ie/ - Database of Irish Excavation Reports (URL accessed 14-01-2025).

Figure 13-8: Panoramic view of Area One, looking Southwest

13.4.8.2 Area Two

This is a roughly trapezoidal-shaped area of undulating pasture, sloping from north and south, and enclosed by fences, banks and hedgerow (see Figures 13-9 and 13-10 below). There was no visible indication of any archaeological, architectural or cultural heritage material at ground level.

Figure 13-9: View of Area Two, looking West

Figure 13-10: Drone view of Area Two, looking East

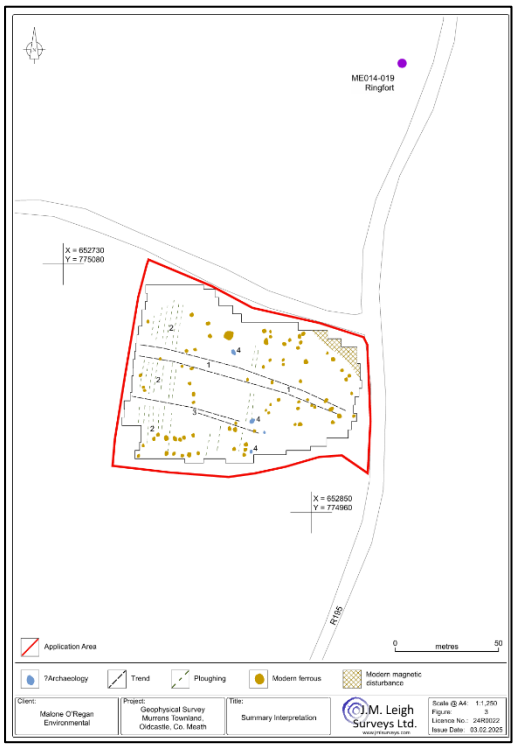
13.4.9 Geophysical Investigation

A detailed gradiometry survey of the unextracted art of the Site (Area Two) was conducted by J. M. Leigh Surveys Ltd. in January 2025 (NMS Licence No. 25R0022) on 1 Ha. There were four anomalies identified and numbered in the report (see Table 13-3 and Fig. 12-11 below and Appendix 13-3). There was nothing of archaeological significance identified. The anomalies appear to represent a former trackway of likely agricultural origin, ploughing, a probable field boundary and buried iron debris.

Table 13-4: Geophysical Anomalies Identified in the Study Area

No.	Description	Interpretation	Significance	Impact	Recommendation
1	Parallel faint liner trends traverse the dataset east to west. These are c.5m apart	Most likely represent a former trackway of likely agricultural origin	Low	High	Don't test
2	Parallel linear trends are perpendicular	Ploughing activity	Low	High	Don't test
3	Faint linear trends	Aligned with and may represent a former field boundary or division	Low	High	Don't test
4	Isolated responses within the data	Responses have no clear archaeological pattern and may equally represent more deeply buried modern ferrous debris.	Low	High	Don't test

Figure 13-11: Murrens geophysical survey interpretation map



13.5 Characteristics and Potential Effects of the Proposed Development

13.5.1 Potential Effects

There will be a negative, moderate and long-term effect on the setting of a ringfort (ME14-019--) located in a field north of the Site.

There will be no direct effects on any other known items of archaeology, buildings of special architectural heritage interest, or cultural heritage at or within the vicinity of the Site at any stage of the Proposed Development.

The four anomalies identified in Area Two by the geophysical survey will be affected by the proposal but they are not considered to be of archaeological significance.

13.5.2 'Do Nothing' Effect

If the Proposed Development were not to proceed, there would be no negative effect on the cultural heritage.

13.5.3 Worst-Case Effect

No worst-case scenario has been identified.

13.5.4 Major Accidents/Unplanned Events

The assessment has identified no effects on any known items of archaeology, buildings of special architectural heritage interest, or cultural heritage in the Site or the vicinity arising from unplanned events associated with the proposal.

13.6 Proposed Mitigation Measures /Factors

The effects on the setting of the ringfort ME014-019---- will be mitigated by the construction of a landscaped screening hedge on the northern side of the Site facing the monument.

The four anomalies identified in Area Two by the geophysical survey will be affected by the proposal, but they are not considered to be of archaeological significance.

No other effects on archaeological, architectural, or cultural heritage have been identified, and no mitigation is required.

13.7 Cumulative and In-Combination Effects

No screened projects in the vicinity of the Site, which may lead to cumulative effects, have been identified, and no cumulative effects arise.

13.8 Interaction with other Environmental Attributes

Chapter 5 – Population and Human Health: Loss of cultural heritage elements can impact on population in terms of the loss of knowledge. The effect of the Proposed Development on cultural heritage has been assessed in this chapter, with the conclusion that there will be no residual effect on cultural heritage. There will therefore be no effect on population and human health.

Chapter 12 - Landscape and Visual Impact: There is a possible correlation between the effect of the Proposed Development on the local landscape/visual effects of the Proposed Development and the effect of the Proposed Development on cultural heritage. As per section 13.6 above, the creation of landscaped screening will mitigate the effect on cultural heritage.

No other interaction with other environmental attributes has been identified.

13.9 Indirect Effects

There will be no indirect effects on any known items of archaeology, buildings of special architectural heritage interest, or cultural heritage in the Site or the vicinity during any stage of the Proposed Development

13.10 Residual Effect

There will be no residual effect on cultural heritage.

13.11 Monitoring

No additional monitoring will be required.

13.12 Reinstatement

The Site will be subject to a Restoration Plan following the cessation of on-site extraction. Details of this Restoration Plan are provided as part of this planning application. These works have been fully assessed in this chapter.

13.13 Difficulties Encountered

No difficulties were encountered during the desktop study, field survey or in preparing this report.

13.14 References

[1] EPA, "Advice Notes on Current Practice (in the preparation of Environmental Impact Statements)," EPA, 2003.

[2] EPA, "Guidelines on the Information to be contained in Environmental Impact Assessment Reports," EPA, Wexford, 2022.

[3] Meath County Council, "Meath County Development Plan 2021 - 2027," MCC, 2021.

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[13] R. Kavanagh, "A reconsideration of razors in the Irish earlier Bronze Age," *Journal of the Royal Society of Antiquaries 121,* pp. 77-104, 1991.

[14] D. Simpson, "The stone battle axes of Ireland," *Journal of the Royal Society of Antiquaries 120,* pp. 5-40, 1990.

[15] J. Waddell and B. O'Riordain, The Funerary Bowls and vases of the Irish Bronze Age, Galway: Galway University Press, 1993.

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FIGURES

TABLES

14 MATERIAL ASSETS - TRAFFIC & TRANSPORT

14.1 Introduction

This chapter reports the findings of a retrospective assessment of the likely significant effects on traffic and transportation of quarrying/extraction activities within the Site and the further extension of quarrying activities into available lands to the northeast of the Site.

Chapter 3 (Description of Development) fully describes the Proposed Development.

14.2 Methodology

This chapter describes the assessment methodology to assess the impact the quarrying/extraction activities at Murrens Quarry have on the surrounding road network. The assessment describes the existing situation at the Site in terms of access while also describing the effect of the existing situation on the external road network. The methodology adopted for this assessment is summarised as follows:

- 12-hour traffic counts were undertaken by IDASO on 14th January 2025. Count information was obtained from the existing R195 / L68185 priority junction, which provides access to the existing Site;
- Existing Traffic Assessment - A spreadsheet model was created which contains the base year do-nothing traffic count data described above. The traffic count data was used to develop a PICADY model of the existing R195 / L68185 priority junction; and,
- Future Year Assessment—The estimated future year traffic volumes on the study area road network, as a result of the increase in background traffic and development-related traffic, were used to assess the junction's future operational performance at the current year, five years after opening, and fifteen years after opening.

14.2.1.1 Relevant Guidelines, Policy and Legislation

The following guidance documents have been utilised in the assessment of the potential traffic and transport-related impacts on the regional and local road network:

- EPA Guidelines on the information to be contained in Environmental Impact Assessment Reports, 2022 [1];
- Traffic and Transport Assessment Guidelines, by Traffic Infrastructure Ireland (formerly the NRA), 2014 [2];
- Transport Infrastructure Ireland Publications (Standards and Technical) documents;
- Guidelines for the Environmental Assessment of Road Traffic, (IEMA) 1994 [3]; and,
- Meath County Development Plan 2021-2027 [4].

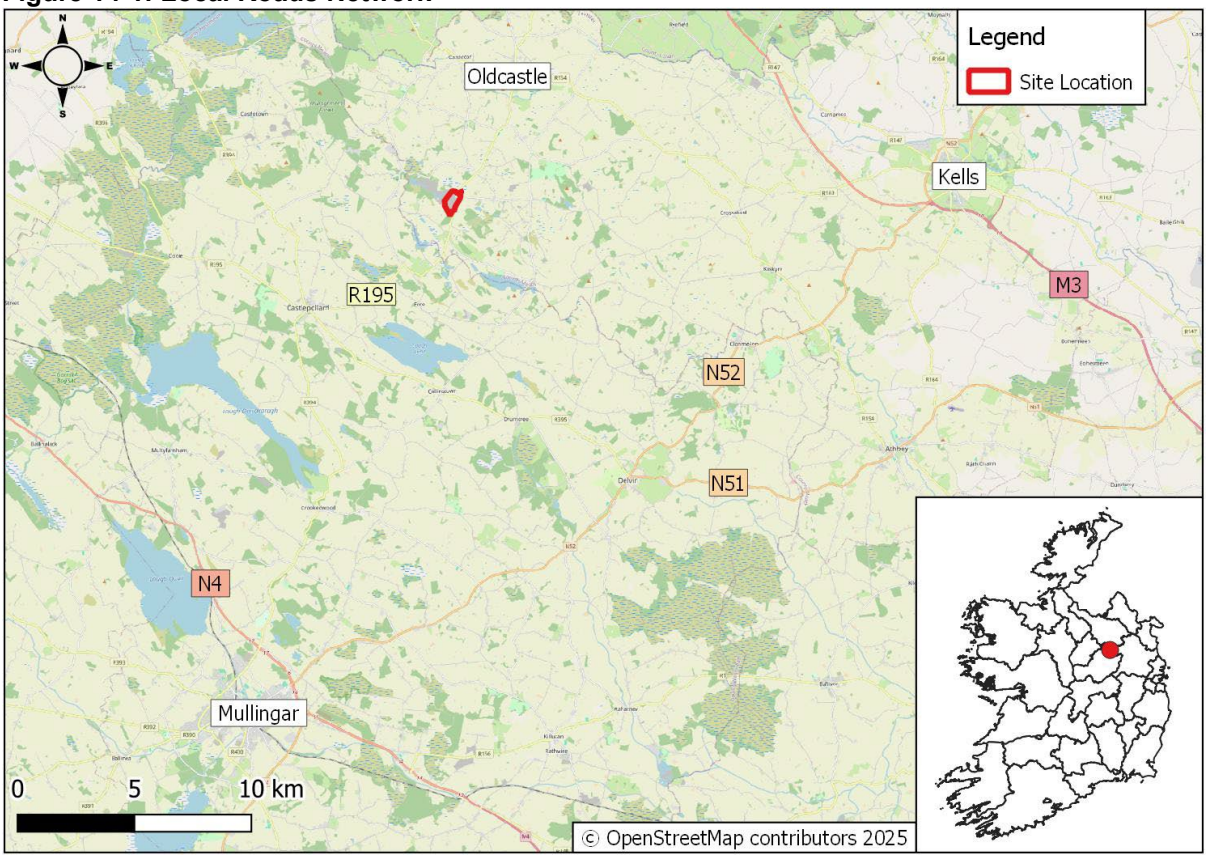
A summary of the relevant traffic and transport-related policy context in relation to the Site is outlined below.

14.3 Receiving Environment

14.3.1 Existing Road Network

The existing road network within the vicinity of the Site is illustrated in Figure 14-1 below and is described further below.

Figure 14-1: Local Roads Network



Access to the existing Site is via the L68185 local road. The L68185 is an approximately 200-m-long cul-de-sac that provides access to the Quarry, a farmyard, and several residential dwellings. It also provides access to the R195 regional road.

The R195 regional road carries local traffic between Oldcastle and Castlepollard. A speed limit of 80km/h applies along the existing R195 regional road, while no speed limit signs are provided along the L68185.

14.3.2 Existing Traffic Volumes

Traffic flows for the existing R195 / L68185 priority junction are provided in Appendix 14-1 and summarised in Tables 14-1 and 14-2 below.

Table 14-1: R195 / L68185 Priority Junction – AM Peak

From / To	R195 (south)	L68185	R195 (north)	Totals
R195 (south)	0	1	54	**55**
L68185	1	0	4	**5**
R195 (north)	68	6	0	**74**
Totals	**69**	**7**	**58**	**134**

Table 14-2: R195 / L68185 Priority Junction – PM Peak

From / To	R195 (north)	L68185	R195 (south)	Totals
R195 (north)	0	4	59	**63**

From / To	R195 (north)	L68185	R195 (south)	Totals
L68185	5	0	0	**5**
R195 (south)	87	1	0	**88**
Totals	**92**	**5**	**59**	**156**

From the traffic counts it is noted that the traffic flows along the existing R195 are low during the AM and PM peak hours.

During the 12-hour traffic count, it was noted that there were 16 HGVs entering the L68185 and 15 HGVs exiting the L68185, which provides access to the Site.

At present, the Quarry currently employs ten full-time staff across their offsite working crew and onsite staff.

The Quarry currently operates from 07:00 to 18:00 Monday to Friday and from 07:00 to 13:00 on Saturdays

14.3.3 Background Traffic

TII issues a range of traffic growth factors to be applied to existing traffic flows, which are broken down into three groups: low growth, medium growth and high growth. Due to the nature and location of the Proposed Development, it is assumed that medium growth is most likely for the surrounding road network.

The zone in which the Site is located is numbered 289 in the TII National Traffic Model. The medium growth factors for each operational phase are presented in Table 14-3.

Table 14-3: Future Year Traffic Growth

Zone	2024 Development Operational	2026 Development Operational	2031 Development Operational	2041 Development Operational
289	1.00	+ 1.68%	+ 10.50%	+ 15%

These percentages have been used to predict the increase in background traffic along the road network surrounding the Proposed Development that will occur in future years. Full summary tables and predicted future traffic flows for 2026, 2031 and 2041 future years are included in Appendix 14-2 – Traffic Flow Sheets.

14.4 Characteristics and Potential Effects

14.4.1 Traffic Flow

It is proposed to extend the Quarry to allow for further extractive activities. However, it should be noted that the current number of HGV's entering and exiting the Site on a daily basis will not change. The extension to the Quarry will not result in an increase in HGV traffic.

The number of vehicular trips (cars, Light Goods Vehicles ('LGVs') & HGVs) currently entering and exiting the Site during the AM and PM peak hours were abstracted from the traffic count and are shown in Table 14-4 below:

Table 14-4: AM and PM Peak Traffic Flows

Peak	Trips to Development	Trips from Development
AM Peak	5	7
PM Peak	5	5

14.4.2 Junction Capacity Assessment

A capacity assessment using the computer programme PICADY for the priority junction was carried out for the following junctions:

- the existing R195 / L68185 priority junction.

Full details and results of capacity assessments are contained in Appendix 14-3 – PICADY Results. The parameters shown in the tables are defined as follows:

- **Ratio of Flow to Capacity ('RFC')** is a factor indicating the flow on a junction arm relative to its capacity. An RFC of 1.0 means the junction has reached its ultimate capacity, and an RFC of 0.85 means that the junction has reached its reserve capacity;
- **Avg. Queue** is the average number of vehicles queued over the time period on the junction approach; and,
- **Queue delay** is the average number of seconds of delay to each vehicle in the time period.

Table 14-5 below shows the predicted RFC values (Ratio of Flow to Capacity), average queue lengths, average vehicle delay and total delays for the R195 / L68185 priority junction.

Table 14-5: R195 / L68185 Priority Junction

Year	Period	Approach	Predicted RFC value	Avg Queue (vehicles)	Queue delay (secs./veh.)
2025 Base Flows	AM Peak	R195 (south)	-	-	-
		L68185	0.01	0	7
		R195 (north)	0.01	0	6
	PM Peak	R195 (south)	-	-	-
		L68185	0.01	0	9
		R195 (north)	0.00	0	6
2026 Development Operational	AM Peak	R195 (south)	-	-	-
		L68185	0.01	0	7
		R195 (north)	0.01	0	6
	PM Peak	R195 (south)	-	-	-
		L68185	0.01	0	9
		R195 (north)	0.00	0	6
2031 Development Operational	AM Peak	R195 (south)	-	-	-
		L68185	0.01	0	7
		R195 (north)	0.01	0	6
	PM Peak	R195 (south)	-	-	-
		L68185	0.02	0	9
		R195 (north)	0.00	0	6
2041 Development Operational	AM Peak	R195 (south)	-	-	-
		L68185	0.01	0	7
		R195 (north)	0.01	0	6
	PM Peak	R195 (south)	-	-	-
		L68185	0.02	0	9
		R195 (north)	0.00	0	6

At present, the existing R195 / L68185 Quarry priority junction currently operates within capacity with no queues and minimal delays during the AM and PM peak hour.

In 2026, 2031 and 2041, with the site operational, the existing R195 / L68185 priority junction will continue to operate within capacity with no queues and minimal delays during the AM and PM peak hours.

14.5 Proposed Mitigation Measures and/or Factors

HGV traffic can be of particular concern to both local residents and highway users, and the mitigation measures outlined below are designed to alleviate any adverse impacts:

- The Applicant will adhere to a routing policy to ensure all movements are made via the strategic road network to avoid HGVs passing through residential areas as far as is practical;
- The Applicant will employ a policy of safety and environmental awareness for all HGV drivers accessing the Site; and,
- The Applicant will continuously monitor the routing policy to ensure all movements are made via the strategic road network to ensure that delays and impact at key junctions are minimised.

14.6 Cumulative and In-Combination Impacts

At present there are no proposed developments that will have a potential to impact on traffic in the area.

14.7 Interaction with other Environmental Attributes

The environmental attributes which Traffic interacts with include:

1. Chapter 5 (Population and Human Health): Climate change and GHG emissions is an important consideration for human health and a pleasant living environment. This is addressed above;
2. Chapter 9 (Air Quality): Emissions from traffic have the potential to impact Air Quality in areas in close proximity to roads. This is addressed in Chapter 9;
3. Chapter 10 (Climate): Emissions of GHGs from traffic have the potential to impact the global climate. This is addressed in Chapter 10; and,
4. Chapter 11 (Noise and Vibration): Traffic related to the development has the potential to increase noise levels in the local area. This is addressed in Chapter 11.

14.8 Indirect Impacts

There are no likely indirect impacts arising from the Proposed Development.

14.9 Residual Impacts

The flow-to-capacity RFC ratios of the junction that provides access to the Quarry are significantly below its ultimate capacity. The local road infrastructure has the capacity to cater for the past and current traffic loads, and therefore, the existing Site does not have a significant impact on the local road network infrastructure.

14.10 Monitoring

No monitoring is required

14.11 Reinstatement

The Site will be subject to a Restoration Plan following the cessation of on-site extraction. Details of this Restoration Plan are provided as part of this planning application. Traffic arising from these works will not exceed traffic levels as assessed in this chapter.

14.12 Difficulties Encountered in Compiling this Information

No difficulties were encountered.

14.13 References

[1] EPA, “Guidelines on the Information to be Contained in Environmental Impact Assessment Reports,” Environmental Protection Agency, Dublin, 2022.

[2] TII, “Traffic and Transport Assessment Guidelines,” TII, Dublin, 2014.

[3] IEMA, “Guidelines for the Environmental Assessment of Road Traffic,” IEMA, 1994.

[4] Meath County Council, “Meath County Development Plan 2021 - 2027,” MCC, 2021.

TABLES

15 INTERACTIONS OF THE FOREGOING

The major interactions between the environmental impact topics are assessed within the above Chapters of this EIAR. Table 15-1 demonstrates a matrix to summarise the interactions between impacts on the various topic areas.

Table 15-1 Interactions Between Impacts Presented in the EIAR

Description	Population & Human Health	Biodiversity	Land, Soils & Geology	Water	Air Quality	Climate	Acoustics (Noise & Vibration)	Landscape and Visual	Cultural Heritage	Material Assets – Traffic & Transport
Population & Human Health		X	✓	✓	✓	✓	✓	✓	X	✓
Biodiversity	X		X	✓	✓	✓	✓	✓	X	X
Land, Soils & Geology	X	✓		✓	✓	X	✓	✓	X	✓
Water	✓	✓	✓		X	X	X	X	X	X
Air Quality	✓	✓	X	X		X	X	X	X	✓

Description	Population & Human Health	Biodiversity	Land, Soils & Geology	Water	Air Quality	Climate	Acoustics (Noise & Vibration)	Landscape and Visual	Cultural Heritage	Material Assets – Traffic & Transport
Climate	✓	✓	X	X	X		X	X	X	✓
Acoustics (Noise & Vibration)	✓	✓	X	X	X	X		X	X	✓
Landscape & Visual	✓	✓	X	X	X	X	X		X	✓
Cultural Heritage	X	X	X	X	X	X	X	X		X
Material Assets – Traffic & Transport	✓	X	X	X	✓	✓	✓	X	X	

X	No Interaction
✓	Interaction

16 SCHEDULE OF COMMITMENTS

Table 16-1 outlines the environmental commitment which will be undertaken as part of the proposed development.

Table 16-1 Schedule of Commitments

Commitment
General
The Site will comply with all relevant legislation and best practice to reduce any potential environmental impacts. HGVs leaving the Site will exit via the wheel wash and weighbridge. The Applicant will ensure that all personnel working on-site are trained and aware of the mitigation measures detailed within the EIAR. Typical operational hours associated with the Site are: • Monday to Friday 07:00 – 19:00; • Saturday 07:00 – 14:00; and, • Sunday & Public Holidays Closed.
Biodiversity
General Measures The following mitigation measures will continue to be adhered to throughout the four phases of the Proposed Development to ensure compliance with wildlife legislation and to mitigate potential environmental impacts: • All activities to comply with relevant legislation and best practices to minimize potential environmental impacts. The mitigation measures outlined in this EIAR and AA will remain fully adhered to; • The Site manager will ensure that all personnel working onsite are trained and informed of the mitigation measures outlined in this EIAR and AA; • An ECoW will remain appointed for the remedial works and will be available should protected or notable species be encountered during operations at the Site; • Prior to works, all Site personnel will receive a toolbox talk regarding the mitigation measures outlined in the EIAR, and AA. Everyone working onsite must understand the role and authority of the ECoW; and, • The ECoW will inspect the Site before works commence and will conduct inspections as required during the works to ensure compliance with the EIAR and AA and all relevant wildlife legislation.
Protection Measures for Sand Martin

Commitment
Given the presence of suitable habitat for nesting sand martins, the following mitigation measures will be implemented: • All personnel operating onsite will be made aware of the presence (including the location) of sand martin nests onsite and the legal protection afforded to this species; • Annual monitoring for breeding sand martin by an experienced ornithologist will be undertaken. The resultant annual report will be submitted to the Planning Authority on an annual basis; • Areas where nesting activity is noted will be clearly marked to ensure disturbance is avoided and routinely monitored, making changes to these marked areas as necessary; • All exposed faces designated for excavation during the breeding season (1*st* March to 31*st* August) will be assessed for their potential to provide breeding sites by February each year under the advice of the ECoW. These areas can then be managed or worked in such a way as to make them unattractive to sand martin so that extraction can continue without interruption. These management procedures include reprofiling the quarry face to less than 45° or utilising netting to cover nest holes outside the breeding season. This will prevent sand martin from nesting / burrowing within the active areas onsite; • Old disused / inactive nests will be removed outside of the nesting season under the supervision of the ECoW, to ensure that no birds are utilising the nests, and the nests are fully removed; • Regular checks of the Site for evidence of sand martin nesting will be undertaken between March and April, particularly after quarry closures such as Easter; • Before the commencement of the nesting season, a suitable aggregate face for sand martins will be set aside. As the phased removal of the earth banks within the Site progresses, a sand martin embankment will be created to ensure active nesting habitat is retained as restoration progresses through the quarry, refer to Section 6.7.1 for further details. The sand martin embankment will be sited away from main activities; and, • Should sand martin be observed nesting within the works area, then the ECoW will be consulted for advice.
Protection Measures for Peregrine Falcon To ensure that peregrine falcon that may use the Site will be protected from the Development, the following measures will be implemented: • All personnel operating on-site will be made aware of the legal protection afforded to peregrine falcons and biodiversity signage will be erected throughout the quarry; • Should a peregrine falcon nest be identified on-site, all personnel operating on the Site will be made aware of the presence and location of the nest. Access will be restricted below cliffs which are actively being utilised by peregrine falcons. This will be done using fencing and / or other appropriate barriers; • Infrastructure will not be installed, nor any material stockpiled, within 25-50m of rock faces supporting peregrine falcon; • A buffer of 25-50m will be implemented from any identified peregrine falcon nests on-site. If stockpile removal works are required during the breeding season (1st March to 31st August), the ECoW will need to be consulted. This distance may be increased if this buffer is deemed insufficient and peregrine falcon becomes disturbed due to works on-site; • As part of the restoration plan for the Site, the quarry ledges will be left in place and unplanted. This will provide suitable breeding habitat for peregrine falcon; and,

Commitment
• An annual peregrine falcon monitoring programme will be established during the remedial phases of the Development to establish the potential effects, if any, of the Development on peregrine falcon. The findings of the monitoring will be submitted to Meath County Council, the National Biodiversity Records Centre and NPWS. The mitigation measures that will be implemented on-site will ensure that the Development does not result in undue disturbances to peregrine falcons.
Protection Measures for Amphibians In order to ensure that the works do not have adverse effects on amphibians, the following remediation / mitigation measures will be implemented: • The ECoW will supervise the construction and planting of the new ponds to ensure that they are constructed in line with the recommendations below; • The infilling of the ponds will be scheduled to take place outside of the amphibian breeding season (February - August). The ECoW will inspect and net the ponds prior to infilling and supervise the works to ensure that no amphibians are present; • The ponds will be constructed at the initial stage of the project and in advance of any known breeding ponds being disturbed / removed; • Any amphibians that are found during the removal of the five ponds will be relocated to the newly created pond in the western part of the Site; and, • Should amphibians be encountered during any other activities associated with the Proposed Development, the ECoW will be consulted for advice.
Protection Measures for Retained and New Hedgerows The following mitigation measures will be implemented to ensure that no unnecessary damage occurs to the hedgerow and treelines onsite and to those being created as part of the Restoration Plan: • All development works will be set back a minimum of approximately 5m from the existing boundary features; • All hedgerows / treelines that will be located within close proximity to the extraction area will be fenced off; • New hedgerow / treeline being created as part of the Restoration Plan will require a 5m buffer as a mitigation measure to counteract the visual impact; • No materials, equipment or machinery will be stored within close proximity to retained hedgerows / treelines; • In order for treeline protection measures to work effectively, all personnel associated with the operation of heavy plant machinery must be familiar with the above principles for the protection of treelines; and, • Notice boards, wires, etc., will not be attached to any trees.
Protection Measures for Terrestrial Mammals The following mitigation measures will be implemented to ensure that the works in relation to the Proposed Development does not have significant impacts on mammals; • Should construction works be required outside of daylight hours, the appointed project ECoW will be consulted as required; • Where deep excavations are required onsite, appropriate measures (such as covers, or fencing) to protect mammals from ingress will be installed as required; and,

Commitment
• If unidentified burrows are identified within the works area during construction, works will cease within that area and the project ECoW will be contacted for advice.

Protection Measures for Invasive Species

The following mitigation measures will be implemented to mitigate against the unintentional introduction of invasive species during quarrying operations;

- All vehicles, machinery and any other equipment used for the works will be washed prior to its use at the Site to prevent the import of plant material or seeds;
- Before machinery or equipment is unloaded at the Site, the equipment will be visually inspected to ensure that all adherent material and debris has been removed;
- Any vehicles and machinery that are not clean will not be permitted entry to the Site;
- All materials to be imported to the Site, including additional planting, will be sourced from a reputable supplier, and records of all material and supplies will be maintained;
- In advance of works, all Site personnel will receive a toolbox talk with regards to invasive species; and,
- Everybody working onsite must understand the role and authority of the ECoW managing the issue of the non-native species.

Land, Soils and Geology

As part of this application, the following mitigation measures will be implemented in relation to geology and soils to be in accordance with the EPA (2006) Environmental Management Guidelines: Environmental Management in the Extractive Industry (Non-Scheduled Minerals) [66]:

General Measures

- All plant and HGVs used will be refuelled at the Site in accordance with existing procedures by trained personnel;
- Items of plant unsuitable for travelling to the refuelling area (dry screening plant), will be refuelled utilising adequately sized and positioned drip trays;
- Fuel (diesel) will be stored in a double-skinned tank in the Site in accordance with existing procedures;
- Spill kits will be available adjacent to all refuelling and fuel storage operations;
- Unauthorised access will be prevented in so far as possible; and,
- Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the Site for disposal or recycling.

Design Measures

The design measures to reduce dust will include:

- Hedgerows surrounding the Site boundary will be maintained and enhanced as required;
- Extraction of the Site will be limited to the ca.6.4ha in the northern portion of the Site, which will limit the areas of exposed soil reducing the risk of disamenity dust leaving the Site boundary;

Commitment
• HGVs entering/exiting the Site will occur via the existing wheel wash; and, Exposed surfaces, e.g. topsoil and overburden storage mounds, will be planted with fast-growing plants. **Construction and Operational Stage** The following mitigation measures will be implemented to minimise dust generation, during the Construction and Operational Stages: • All dust and air quality complaints will be recorded, cause(s) identified, appropriate action taken; • Complaints log will be maintained at the Site office, available for review at any reasonable time; • Training will be to Site personnel on dust mitigation measures to be implemented at the Site; • Regular inspections of Site works will be conducted. The frequency of these inspections will be increased to coincide where the risk of impact is higher during dry and/or windy conditions; Good communications with the local community will be maintained. **Site preparation** • Soil stripping and overburden handling will be avoided during dry and windy (>5.0m/s) conditions; and Overburden will only be worked when it contains a high moisture content. **Mineral processing** • Screening will take place within sheltered parts of the quarry to reduce the likelihood of transport of dust via wind; • Material will be dampened during dry periods prior to crushing operations; • Crushing and screening plant will be used within its design capacity; and, All plant and equipment will be subjected to routine preventative maintenance. **Material Handling** • Materials will be dampened sufficiently during dry conditions; • Clearance of any spillage during extraction will be undertaken regularly to minimise accumulation of loose dry materials; and, Minimisation of drop heights will be maintained. **Vehicle movements** • Abrupt changes in vehicle direction will be avoided where possible; • Loaded HGVs will be covered during windy conditions (>5.0m/s) as practicable;

Commitment
• Regular clearing, grading and maintenance of haul routes will be conducted; • All vehicles will adhere to speed restrictions within and around the quarry (15 km/hr); • Vehicles will be evenly loaded to reduce the possibility of spillages; • Dampen haul routes where required using a water bowser; • HGVs will pass through wheel wash prior to leaving the Site; and, • Road sweepers will be utilised to maintain local roads on a need-to basis.
Water
As part of this application, the following mitigation measures will be implemented to be in accordance with the EPA (2006) Environmental Management Guidelines: Environmental Management in the Extractive Industry (Non-Scheduled Minerals) [72]: • All plant and HGVs used will be refuelled at the Permitted Area in accordance with existing procedures by trained personnel; • Items of plant unsuitable for travelling to the refuelling area (dry screening plant) will be refuelled utilising adequately sized and positioned drip trays; • Fuel (diesel) will be stored in a double-skinned tank in the Permitted Area in accordance with existing procedures; • Spill kits will be available adjacent to all refuelling and fuel storage operations; • Unauthorised access will be prevented in so far as possible; and, • Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the Registered Area for disposal or recycling.
Air Quality
A Dust Management Plan (‘DMP’) will be prepared for the Site and provided to the Local Authority in advance of works commencing. As part of this application, the following mitigation measures will be implemented in relation to air quality: • All vehicles will adhere to speed restrictions within and around the quarry (15 km/hr); • Vehicles will be evenly loaded to reduce the possibility of spillages; • Dampen haul routes where required using a water bowser; • HGVs will pass through wheel wash prior to leaving the Site; and, • Road sweepers will be utilised to maintain local roads on a need-to basis.

Commitment
Climate
Given the relatively small activity, due to its nature, size, location and intensity of operations, mitigation measures were not considered to be required.
Noise and Vibration

The following mitigation measures will be in place as part of the Proposed Development:
Site Preparation Phase - Noise
The following mitigation measures will be in place during construction:
• Site Preparation works will be designed to avoid noisy work outside the hours of
  ○ Monday to Friday 07:00 to 19:00; and,
  ○ Saturday 07:00 to 14:00.
• Work occurring outside these hours will be subject to tighter construction stage noise limits, as per BS5228 (Section 11.1.1.4.1 of this EIAR);
• Nomination of a responsible person to accept and respond to complaints;
• Ensuring all plant and equipment is serviced and in good repair;
• Avoidance of plant or equipment left idling;
• Planning of works to ensure drop heights from equipment or during demolition are minimised to reduce noise generated; and,
• Noise monitoring programme during construction phase works.
Site Preparation Phase - Vibration
No mitigation required for the Site Preparation Phase relating to vibration control.
Operational Phase - Noise
Plant operating hours will be from 07:00 to 19:00, Monday to Friday and 07:00 to 14:00 Saturdays. No activities will take place on Sundays or Public Holidays.
The equipment associated with the Operational Phase will include both mobile and fixed plant. The following mitigation measures will be in place as part of the Proposed Development:
• All plant (fixed and mobile) is maintained to a high standard to reduce any tonal or impulsive sounds;
• All plant is throttled down or switched off when not in use;

Commitment
• Internal routes are reduced in gradients and routed to minimise noise emissions from **Operational Phase - Vibration** This stage is finished. No mitigation required for the Site Operational Phase. **Restoration Phase - Noise** Plant operating hours will be from 07:00 to 19:00, Monday to Friday and 07:00 to 14:00 Saturdays. No activities will take place on Sundays or Public Holidays. The equipment associated with the Restoration Phase will be mobile during the operational lifetime within the Site. This will aid in reducing noise emissions from the operations on-site to any individual receptor. • All plant (fixed and mobile) is maintained to a high standard to reduce any tonal or impulsive sounds; • All plant is throttled down or switched off when not in use; • Internal routes are reduced in gradients and routed to minimise noise emissions from vehicles on-site.
Landscape & Visual
As the Proposed Development is situated within and adjacent to an existing quarry, the landscape avails of a high degree of existing mature screening. In addition to retaining the existing hedgerows within and around the Site, it is proposed to bolster existing perimeter hedgerows where required along the eastern boundary of the Site. It is also proposed to plant new hedgerows along the north-eastern boundaries of the Site and alongside the R195 and the quarry access road.
Cultural Heritage
The four anomalies identified by the geophysical survey will be affected by the proposal but they are not considered to be of archaeological significance. Any potential effects will be mitigated by the construction of a landscaped screening bund on the northern side of the application site facing the monument. No other effects on archaeological, architectural of cultural heritage have been identified and no mitigation is required.
Material Assets – Traffic & Transport
HGV traffic can be of particular concern to both local residents and highway users, and the mitigation measures outlined below are designed to alleviate any adverse impacts: • The Applicant will adhere to a routing policy to ensure all movements are made via the strategic road network to avoid HGVs passing through residential areas as far as is practical; • The Applicant would employ a policy of safety and environmental awareness for all HGV drivers accessing the Site; and, • The Applicant will continuously monitor the routing policy to ensure all movements are made via the strategic road network to ensure that delays and impact at key junctions are minimised.